YAZDOVSKIY, V., prof.; DENISOV, V., kand.tekhn.nauk

Radio electronics in astronautics. Av.i kosm. 44 no.3:15-18 '62. (MIRA 15:3)

(Radio in aeronautics) (Space flight)

GAZENKO, O., doktor biologicheskikh nauk; GENIN, A., doktor biologicheskikh nauk; YAZDOVSKIY, V., doktor med.nauk

Physiological studies on "Vostok-2." Av.i kosm. 45 no.7:29-34 '62. (MIRA 15:8)

(Space perception)

YAZDOVSKIY, V. I., prof.

Man in the cabin of a spaceship. Av. i kosm. 45 no.9:41-43 '62.
(MIRA 15:10)

(Space flight)

BALAKHOVSKIY, I.S.; MANSUROV, A.R.; YAZDOVSKIY, V.I.

Effect of pure oxygen respiration on the lungs and heart of white rats. Biul. eksp. biol. i med. 53 no.2:43-47 F '62. (MIRA 15:3)

1. Predstavlena deystvitel'nym chlenom AMN SSSR V.V. Parinym.
(RESPIRATION) (HEART)
(LUNGS) (OXYGEN--PHYSIOLOGICAL EFFECT)

L 1062-66 EWT(d)/FBD/EWT(1)/FS(v)-3/EEC(k)-2/EED-2 RD/GW

ACCESSION NR: AR5006997 S/0275/65/000/001/V010/V010

621.38:629.196.4

SOURCE: Ref. zh. Elektronika i yeye primeneniye. Sv. t., Abs. 1 V59

AUTHOR: Akulinichev, I. T.; Bayevskiy, R. M.; Denisov, V. G.; Yazdovskiy, V. I.

TITLE: Biotelemeter systems in astronautics

CITED SOURCE: Sb. Radiotelemetriya v fiziol. i med., Sverdlovsk, 1963, 10-13

TOPIC TAGS: biotelemeter

TRANSLATION: The biotelemeter monitoring of many-day astronautic flights is based on a continuous presence of all sensors and electrodes on the astronaut during the flight and on an automatic control of the shipborne equipment. Eighteen parameters were investigated: electrocardiogram, pneumogram, electric myogram, body temperature, photocardiogram, air pressure, air humidity, air temperature, O_2 content, CO_2 content, etc. TV observation, radiocommunication, and cosmic-radiation monitoring were added to the above measurements. It is believed that the medical-monitoring biotelemeter systems will be developed on the basis of dynamic telemetry and automatic tracking of medical parameters produced by

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ACCESSION NR: AR5006997

detachable sensors and electrodes and also on the basis of biological indication. Use of ingrown telemeter systems is planned. In the future, medical monitoring will be needed during the landing on the planets. Apparently, a "long-distance" dynamic telemetry consisting of a radio link, astronaut suit, ship will be used. The use of biotelemetry is expected in the systems of astronaut radio link intentional and spontaneous biological controls.

SUB CODE: AC, EC ENCL: 00

Card 2/2

OPARIN, A.I., akademik; STUDITSKIY, A.N., prof.; NAUMOV, N.P., prof.; KOVAL'SKIY, V.V.; YUROVA, I.L., dots.; PLATONOV,G.V., prof.;KAGANOV, V.M.; FURMAN, A.Ye., dots.; MEDVEDEV, N.V., prof.; YAKIMOV, V.P., kand. biol. nauk; ZHUKOV-VEREZHNIKOV, N.N.; BONDARENKO, P.P., prof.; MAYSKIY, I.N., prof.; TRIBULEV, G.P., dots.; TSAREGORODTSEV, G.I., dots.; DOBROKHVALOV, V.P., kand. biol. nauk; YAZDOVSKIY, V.I., prof.; VIKTOROVA, V., red.; CHEREMNYKH, I., mlad. red.; ULANOVA, L., tekhn.red.

[Studies on the dialectic of living nature] Ocherk dialektiki zhivoi prirody. Moskva, Sotsekgiz, 1963. 527 p. (MIRA 16:12)

1. Chlen-korrespondent Vsesoyuznoy akademii sel'skokhozyaystvennykh nauk imeni V.I.Lenina (for Koval'skiy).
2. Deystvitel'nyy chlen AMN SSSR (for Zhukov-Verezhnikov).

(Biology--Philosophy)

GENIN, Abram Moiseyevich; GUROVSKIY, Nikolay Nikolayevich; YEMEL'YANOV, Mikhail Dmitriyevich; SAKSONOV, Pavel Petrovich; YAZDOVSKIY, Vladimir Ivanovich; NEYMAN, M.I., red.; BARMAKOV, G.M., tekhn. red.

[Man in space] Chelovek v kosmose. Moskva, Medgiz, 1963. 159 p. (MIRA 17:3)

YAZDOVSKIY, V. I., ANTIPOV, V. V., SAKSANOV, P. P.,

"Investigation of Biological Effect of Cosmic Radiation Under Condition of Space Flights"

report submitted for the 14th Intl. Astronatuical Federation (IAF), Congress, Bioastronatuics Committee, Paris, France, 25 Sep-1 Oct 63

ACCESSION NR: AT4042671 S/0000/63/000/000/0137/0140

AUTHOR: Myasnikov, V. I.; Gorbov, F. D.; Yazdovskiy, V. I.

TITLE: Effects of prolonged isolation

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963. Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy* konferentsii. Moscow, 1963, 137-140

TOPIC TAGS: hypokinesia, blood circulation, man, hypodynamia, physiological function, functional effect

ABSTRACT: Subjects were kept for periods of 10--15 days in continuous isolation in a special chamber. Isolation was assured by absence of two-way communication and almost complete exclusion from all external sources of light, sound, and other stimulii. One-way communication from the subject to the experimentor was performed for limited periods. Evaluation of the functional condition of the organism was performed on the basis of the observation of behavior and emotional reactions, the dynamics of bioelectrical activity of the cortex, the determination of the quickness of response of the motor reaction, and the carrying out of experi-

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ACCESSION NR: AT4042671

mental psychological tasks, and comments of the subjects, which were recorded on a magnetic tape. The experiments indicated that a sharp limitation of general afferentation has considerable effect on the subjects. Neuropsychiatric changes at various stages of the experiment were very varied. The recording of many psychological and physiological indices makes it possible to establish qualitative peculiarities of these changes. In particular, it makes it possible to determine and establish limits for conditions of strain and fatigue. The monotony of the surroundings, the poverty of external impressions, and the solitude were revealed as factors having independent significance as conditions and causes of development of strain and fatigue. This, in turn, determines not only the necessity but also the possibility of setting up countermeasures against these conditions by using stimulation calculated to produce the optimum interaction between the afferent systems.

ASSOCIATION: none

SUBMITTED: 27Sep63 ENCL: 00 SUB CODE: LS

NO REF SOV: 00 OTHER: 00

Card 1/1 2/2

ACCESSION NR: AT4042681 S/0000/63/000/000/0185/0188

AUTHOR: Zhukov-Verezhnikov, N. N.; Mayskiy, I. N.; Yazdovskiy, V. I.; Pekhov, A. P.; Ry*bakov, N. I.; Tribulev, G. P.; Saksonov, P. P.; Dobrov, N. N.; Antipov, V. V.; Kozlov, V. A.; Vy*sotskiy, V. G.; Mishenko, B. A. Ry*bakova, D. K.; Parfenov, G. P.; Pantyukhova, V. V.; Yudin, Ye. V.; Aniskin, Ye. D.

TITLE: The evaluation of the biological effectiveness of space-flight factors with the aid of lysogenic bacteria

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963. Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy* konferentsii. Moscow, 1963, 185-188

TOPIC TAGS: lysogenic bacteria, biological sensor, radiation detector, bacteriophage, phage, vibration, irradiation/Vostok III, Vostok IV

ABSTRACT: Lysogenic bacteria, E. coli K-12 (λ), was carried on spaceships

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ACCESSION NR: AT4042681

Vostok III and Vostok IV as a biological sensor. The advantages of lysogenic bacteria as biological sensors stem not only from their extreme sensitivity to various types of radiation, but also from the fact that induced changes are directly proportional to the dose of irradiation. In addition, E. coli was subjected to the combined effects of radiation and vibration in ground experiments. Vibration was produced by means of a vibrator with frequencies of 35, 70, and 700 cps, an amplitude ranging from 0.4 to 0.005 mm with a load equal to 10 g, for periods of 15, 30, and 60 min. Co^{60} in doses of 100 r at a rate of 21 r per min served as a source of radiation. Lysogenic bacteria carried on spaceships Vostok III and Vostok IV revealed induction of genetic changes produced by space-flight factors which was indicated by a significant increase in the number of phage particles. The induced effect was more pronounced on Vostok III than on Vostok IV. Forty-eight hours after its return to earth, the bacteria carried by Vostok III had produced 4.6 times as many phage particles as controls which had remained on earth. Ground experiments with vibration indicate that the combined vibration and gamma irradiation, followed by a second exposure to vibration, double the biological effectiveness of gamma rays.

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ACCESSION NR: AT4042681

However, when the bacteria is subjected to only a single dose of vibration following irradiation, there is no increase in the number of phage particles as compared to samples which were exposed to irradiation alone. This fact indicates that under space flight conditions vibration sensitizes the lysogenic bacteria to the effect of ionizing radiation. This as yet hypothetical explanation should be substantiated by additional experiments.

ASSOCIATION: none

SUBMITTED: 27Sep63 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

Card 3/3

ACCESSION NR: AT4042721 S/0000/63/000/000/0507/0510

AUTHOR: Yazdovskiy, V. I.; Bryanov, I. I.; Kakurin, L. I.; Kry*lov, Yu. V.; Cherepakhin, M. A.

TITLE: Sensory-motor coordination in weightlessness

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963. Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy* konferentsii. Moscow, 1963, 507-510

TOPIC TAGS: weightlessness, motor coordination, spaceflight, sensory motor coordination, coordination testing, Vostok 3, Vostok 4

ABSTRACT: The effects of prolonged weightlessness on sensory-motor coordination were tested during the flights of Vostok III and Vostok IV, by Nikolayev and Popovich. Prior to the space flight, tests for sensory-motor coordination were worked out in laboratory conditions in a simulated Vostok-type cabin. The first test consisted of stretching out hands towards one of the instrument panels in the front part of the cabin. The cosmonaut would then memorize the position of his hands, close his eyes for 20 seconds, open them, and then evaluate the position

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of his hands. The results of each test were recorded in a flight log. Deviations from the original position were measured in centimeters. The second test consisted of drawing, first with one hand and then with the other, a spiral of three loops, a continuous-line five-pointed star, two vertical lines and two horizontal lines. These tests were performed with eyes open and with the eyes closed. The hands, one of which held the log in which the drawings were made, were outstretched. The relatively simple first test was performed with approximately equal accuracy on the ground and in weightlessness. The results of the second test were somewhat more complex because the tests, even on the ground, were not performed equally well with the right as with the left hand, and not as well with the eyes closed as with the eyes open. However, a comparison of results obtained by the two cosmonauts during space flight with their performance in ground tests indicates that weightlessness does not reduce the quality of the sensory-motor coordination as far as this particular test is concerned. A comparison of the drawings indicates that in weightlessness the quality of the drawing was not only as good but actually better than that obtained on earth. This slight improvement can perhaps be explained by the comment of Popovich, who stated that the novelty of being in a weightless state induces a special alertness. Both cosmonauts stated that they felt they

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had no difficulty in working in a weightless state. Both felt that weightlessness presents no barrier in carrying out assigned flight tasks.

ASSOCIATION: none

SUBMITTED: 27Sep63 ENCL: 00 SUB CODE: LS

NO REF SOV: 000 OTHER: 000

Card 3/3

L 11107-63 EWT(l)/FCC(w)/ES(v)/EPC-2/ES(v)/ES(a)/ES(b)/ES(c)/ES(k)/
ES(t)-2/BDS AFFTC/APMC/SSD-3 Pi-4/Pe-4/Pi-4/Po-4/Pq-4 TT/AM-2/
ACCESSION NR: AN3001369 S/9008/63/000/150/0002/0002

AUTHOR: Yazdovskiy, V. I.

TITLE: Speech of V. I. Yazdovskiy 91

SOURCE: Krasnaya zvezda, 26 Jun 63, 2, col. 1-4

TOPIC TAGS: spaceflight, orbital spaceflight, spaceflight physiological effect, Vostok-5, Vostok-6

ABSTRACT: According to V. I. Yazdovskiy the main medicobiological objectives of the Vostok-5 and Vostok-6 flights were as follows: further study of the effects of prolonged spaceflight on the human organism; study of the psychophysiological potential and working ability of man under conditions of extended weightlessness combined with other spaceflight factors; study of particular effects of conditions of spaceflight on the human female organism; further study of how circadian periodicity of physiological processes in humans is affected by spaceflight; study of the effectiveness of methods used for selection and training of cosmonauts; study of the effectiveness of operation of the life-support and flight-safety systems; and the study of how the system of medicobiological control was able to monitor the condition of the cosmonauts and the microclimate of the spaceship

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ACCESSION NR: AN3001369

cabin. The use of voice contact (radiotelephone) closed the monitoring gap which formerly existed between the physician on the ground and the cosmonaut in space. Yazdovskiy estimates that the total absorbed radiation dose was 35 to 40 millirad for By*kovskiy and about 25 millirad for Tereshkova. By*kovskiy left his restraint couch four times (during the 18th, 34th, 50th, and 66th orbits) and performed a series of complex tasks in a free-floating state. Sharp movements and other vestibular tests did not result in any unpleasant sensations. By*kovskiy's appetite and sleep were good and his excretory systems functioned normally. His ability to perform assigned tasks remained high. The orbital flight of Tereshkova was planned for one 24-hour period. Her condition, however, made it possible to extend it to 3 days.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 11Jul63 ENCL: 00

SUB CODE: AM NO REF SOV: 000 OTHER: 000

Card 2/2

YAZDOVSKIY, V.I., prof.; DENISOV, V.G., kand.tekhn.nauk

Flights of the spaceships "Vostok-5" and "Vostok-6." Vest. AN SSSR 33 no.9:17-22 S '63. (MIRA 16:9)
(Vostok (Manned satellite))

ZHUKOV-VEREZHNIKOV, N., prof.; KOP'YEV, V., dotsent; MAYSKIY, I., prof.;
PEKHOV, A., doktor biolog.nauk; TRIBULEV, G., dotsent;
YAZDOVSKIY, V., prof.

Biological aspects of the theory of relativity. Av.i kosm. 45
no.2:13-35 F '63. (MIRA 16:2)

1. Deystvitel'nyy chlen AMN SSSR (for Zhukov-Verezhnikov).
(Space biology)

YAZDOVSKIY, Vladimir Ivanovich, prof.; SOROKO, Ya.I., red.; RAKITIN, I.T., tekhn. red.

[Biology and the cosmos; problems of space biology and medicine] Biologiia i kosmos; problemy kosmicheskoi biologii i meditsiny. Moskva, Izd-vo "Znanie," 1964. 79 p. (Novoe v zhizni,nauke, tekhnike. VIII Seriia: Biologiia i meditsina, no.1/2) (MIRA 17:2)

VOLYNKIN, Yu.M.; YAZDOVSKIY, V.I., prof.; GENIN, A.M.; GAZENKO, O.G.; GUROVSKIY, N.N.; YEMEL'YANOV, M.D.; MIKHAYLOVSKIY, G.P.; GORBOV, F.D.; SERYAPIN, A.D.; BAYEVSKIY, R.M.; ALTUKHOV, G.V.; KOPANEV, V.I.; KAS'YAN, I.I.; MYASNIKOV, V.I.; TERENT'YEV, V.G.; BRYANOV, I.I.; FEDOROV, Ye.A.; FOMIN, V.S.; ARUTYUNOV, G.A.; ANTIPOV, V.V.; KOTOVSKAYA, A.R.; KAKURIN, L.I.; TSELIKIN, Ye.Ye.; USHAKOV, A.S.; VOLOVICH, V.G.; SAKSONOV, P.P.; YEGOROV, A.D.; NEUMYVAKIN, I.P.; TALAPIN, V.F.; SISAKYAN, N.M., akademik, red.; KOLPAKOVA, Ye.A., red.izd-va; ASTAF'YEVA, G.A., tekhn.red.

[First group space flight; scientific results of medical and biological studies carried out during the group orbital flight of manned satellites "Vostok-3" and "Vostok-4] Pervyi gruppovoi kosmicheskii polet; nauchnye rezul'taty mediko-biologicheskikh issledovanii, provedennykh vo vremia gruppovogo orbital'nogo poleta korablei-sputnikov "Vostok-3" i "Voskot-4." Moskva, Izd-vo "Nauka," 1964. 153 p. (MIRA 17:3)

ACCESSION NR: AT4037678 S/2865/64/003/000/0005/0009

AUTHOR: Yazdovskiy, V. I.

TITLE: Basic scientific trends of space biology in the conquest of space

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy* kosmicheskoy biologii, v. 3, 1964, 5-9

TOPIC TAGS: space flight, manned space flight, hygiene, respiration, life support, closed ecological system

ABSTRACT: The basic Soviet program in space biology and space medicine covers the following areas: 1) Study of prolonged effects of unusual space-flight factors on human and animal organisms and development of measures to increase their resistance to extreme conditions; 2) Study of psychological and physiological limitations of man in controlling spaceships, spaceship systems, and research equipment during prolonged flight in small cabins; 3) Development of methods of selection and training of cosmonauts and, particularly, of multi-manned spacecrews; 4) Determination of conditions necessary for life support spaceship cabins and development of systems for feeding and personal hygiene; 5) Development of optimum conditions of gas composition for the artificial atmosphere in spaceship cabins; 6) Research and

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ACCESSION NR: AT4037678

development of life support systems for prolonged manned space flight based on a closed ecological cycle involving man, plants, and animals in small cabins; 7) Research and development of life support systems for man in spaceflight using physical and chemical methods of regenerating the atmosphere and other elements in spaceship cabins; 8) Study of radiation conditions to provide for radiation safety during manned spaceflights; 9) Research and development of personal-safety and emergency-escape equipment; 10) Investigation of forms of life existing in space and on other planets.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00

SUB CODE: PH, LS NO REF SOV: 000 OTHER: 000

Card 2/2

GAZENKO, O.G.; CHERNIGOVSKIY, V.N.; YAZDOVSKIY, V.I.

Biological and physiological studies during flights on board of rockets and artificual earth satellites. Probl. kosm. biol. 3: 23-36 '64. (MIRA 17:6)

YAZDOVSKIY, V.I.; KAS'YAN, I.I.; KOPANEV, V.I.

Basic problems in studying weightlessness. Probl. kosm. biol. 3:37-58 '64. (MIRA 17:6)

DENISOV, V.G.; KUZ'MINOV, A.P.; YAZDOVSKIY, V.I.

Basic problems of engineering psychology in space flight.
Probl. kosm. biol. 3:66-79 '64. (MIRA 17:6)

S/2865/64/003/000/0080/0088

ACCESSION NR: AT4037680

AUTHOR: Yazdovskiy, V. I.; Yemel'yanov, M. D.

TITLE: Problems of the physiological interaction of analyzers applicable to space flight

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy* kosmicheskoy biologii, v. 3, 1964, 80-88

TOPIC TAGS: manned space flight, physiology, weightlessness, vestibular analyzer, visual analyzer, proprioception, vestibular function

ABSTRACT: To assess the dynamic effects of space flight on the human organism, Yemel'yanov and his co-workers performed a series of experiments to establish the interaction of space-flight conditions on the vestibular, visual, and proprioceptor analyzer systems. The nature of muscular activity (proprioceptor afferentation) exerts a considerable effect on the threshold of sensitivity of the vestibular organ and also on the threshold of sensory and motor vestibular reactions. Static muscular tension, especially on the side opposite the stimulated labyrinth, lowers vestibular sensitivity. Upright balancing, characterized by oscillations of the center of gravity with respect to the gravitational vertical, brings about the

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ACCESSION NR: AT4037680

opposite effect. Straining of the eyeball muscles also has an effect: fixing the vision on motionless objects inhibits the vestibular motor reactions, while optokinetic stimulation increases them. Inhibition of the vestibular functions by fixation of the eye on immobile objects depends on the distance of the object and the angle of vision. Vestibular-spinal reflexes, which determine the tone of skeletal and ocular musculature, are affected by the presence or absence of visual function. In the absence of gravity a conflict can arise between visual and vestibular information. If man has a fixed base of support, he can acquire some of the sensations of gravity. Thus, objects seen moving in the visual field will not cause a conflict in perception of the external world as long as the man thinks he knows what the direction of gravity is. However, if he loses his concept of gravitational orientation, then moving objects in the visual field cause a disorientation and are sometimes accompanied by vegetative reactions. Flights along parabolic trajectories are characterized by a more or less prolonged period of the aftereffect of the vestibular stimulator which is caused by the excess acceleration which preceded weightlessness. For that reason, vestibular reactions related to the short period of weightlessness do not disappear and in some cases become aggravated, which may be due to the absence of the inhibiting effect from the motor analyzer. More research is required in this area. The vestibular system of training cosmonauts for space flight was based on these experiments. Primary attention

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ACCESSION NR: AT4037680

was given to the dependence of vestibular phenomena on visual stimulation and muscular effort. By prolonged training it was possible to increase significantly the resistance of cosmonauts to vestibular stimulation and, as a result, no vegetative disorientation reactions were noted during their flights. This was also confirmed by the use of occulograms. It was not possible to obtain evidence of nystagmus, either spontaneously or in conjuction with vestibular tests.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00

SUB CODE: PH, LS NO REF SOV: 020 OTHER: 017

Card 3/3

AKULINICHEV, I.T.; ANDREYEV, L.F.; BAYEVSKIY, R.M.; BAYKOV, A.Ye.: BUYLOV, G.G. GAZENKO, O.G.; GRYUNTAL', R.G.; ZAZYKIN, K.P.; KLIMENTOV, Yu.F.; MAKSIMOV, D.G.; MERKUSHKIN, Yu.G.; MONAKHOV, A.V.; PETROV, A.P.; RYABCHENKOV, A.D.; SAZONOV, N.P. ; UTYAMYSHEV, R.I.; FREYDEL', V.R.; KHIL'KEVICH, B.G.; SHADRINTSEV, I.S.; SHEVANDINA, S.B.; ESAULOV, N.G.; YAZDOVSKIY, V.I.

Method and means of medical and biological studies in a space flight. Probl. kosm. biol. 3:130-144 '64. (MIRA 17:6)

ACCESSION NR: AT4037688 S/2865/64/003/000/0184/0192

AUTHOR: Zhukov-Verezhnikov, N. N.; Yazdovskiy, V. I.; Mayskiy, I. N.; Tribulev, G.P.; Pokhov, A.P.; Saksonov, P.P.; Ry*bakov, N. I.; Antipov, V. V.; Artem'yev, N.S.; Kozlov, V. A.; Mishchenko, B. A.; Yudin, Ye. V.; Ry*bakova, K.D.; Aniskin Ye. D.

TITLE: Microbiological and cytological research in the conquest of space

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy* kosmicheskoy biologii, v. 3, 1964, 184-192

TOPIC TAGS: microbiology, cytology, lysogenic bacteria, synchrocyclotron, cyclotron, telemetry, space flight, antiradiation drug, ionizing radiation

ABSTRACT: Microbiological research has concentrated on highly radiosensitive biological objects which register molecular changes in response to irradiation. The specific object selected was lysogenic bacteria, E. coli K-12 (λ), which is very sensitive to ionizing radiation and reacts by producing phage particles. Recent synchrocyclotron experiments have shown that E. coli bacteria react similarly to protons and neutrons and that the phage production is proportional to the irradia-

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ACCESSION NR: AT4037688

tion dose. Other experiments have shown that when subjected to vibration, lysogenic bacteria do not produce phage particles. The value of this lysogenic system stems from the fact that it is highly sensitive to radiation but stable under other stress factors of space flight. In the immediate future it will be necessary to couple this biological radiation sensor with an automatic system which will permit registration and telemetry of information from space to earth. The principles for creating such an automatic telemetry system have already been worked out, and this makes it possible to begin construction of experimental equipment. Apparently, this lysogenic system can also be used for testing the effectiveness of antiradiation drugs. Recent experiments with β-mercaptopropylamine have shown that phage production can be reduced by the use of such drugs. If it turns out that phage production induced by heavy particles can also be reduced by antiradiation drugs, then the lysogenic system could be used for a fast primary selection of new means of chemical protection against radiation.

ASSOCIATION: none

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ACCESSION NR: AP4037622 S/0216/64/000/003/0352/0368

AUTHOR: Kas'yan, I. I.; Kopanev, V. I.; Yazdovskiy, V. I.

TITLE: Circulation of the blood during weightlessness

SOURCE: AN SSSR. Izv. Seriya biologicheskaya, no. 3, 1964, 352-368

TOPIC TAGS: weightlessness, hemodynamics, circulation

ABSTRACT: The authors review data collected on weightlessness from the first flights of dogs in high altitude rockets in the 1949-1956 period to the last manned spaceflight of Bykovskiy and Tereshkova. Data collected during these high-altitude and orbital flights include pulse frequency, arterial pressure, and bioelectrical activity of the heart (EKG). An analysis of these data indicates an absence of serious disruptions of circulation of the blood. Weightlessness, whether short-term or up to 5 days in duration, causes three types of reactions. The first is a distinct reduction in pulse frequency, accompanied by a reduction of arterial pressure (sometimes lower

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ACCESSION NR: AP4037622

than at sea level). A second type manifests itself in an increase in pulse rate, and a small increase in blood pressure. The third type has no significant changes. The reduction, under weightless condition, of pulse frequency and arterial pressure accompanied by an increased lability of some vegetative indices, and a slowing down of the normalization rate of indices of functional state of the cardiovascular system can be explained by a lowering of the hydrostatic pressure of the blood (this is the direct effect of weightlessness) and a disruption in the functioning of the analyzer systems (the indirect effect of weightlessness). Orig. art. has: 7 figures and 10 tables.

ASSOCIATION: none

SUBMITTED: 28Nov63 DATE ACQ: 05Jun64 ENCL: 00

SUB CODE: LS, PH NO REF SOV: 020 OTHER: 014

Card 2/2

ACCESSION NR: AP4039713 S/0205/64/004/003/0337/0343

AUTHOR: Sisakyan, N. M.; Antipov, V. V.; Saksonov, P. P.; Yazdovskiy, V. I.

TITLE: The biological action of cosmic radiation under space flight conditions

SOURCE: Radiobiologiya, v. 4, no. 3, 1964, 337-343

TOPIC TAGS: manned space flight, cosmic radiation, Vostok, radiobiology

ABSTRACT: The article reviews the historical development of experiments concerning the effects of cosmic radiation on the organism and concentrates on results of the latest Soviet space probes. The mean intensity of cosmic radiation registered by means of various dosimetric devices was 10 ± 2 mrad per day on Sputniks 2, 4, and 5, and on Vostoks 1, 2, 3, and 4. The bone marrow cells of mice, seeds of plants, lysogenic bacteria, and Tradescantia microspores all exhibited small but significant alterations as a result of exposure to conditions of space flight and cosmic radiation.

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YAZDOVSKIY, V. I.

ACCESSION NR: AT4042642 S/0000/63/000/000/0006/0008

AUTHOR: Akulinichev, I. T.; Bayevskiy, R. M.; Belay, V. Ye. Vasil'yev, P. V.; Gazenko, O. G.; Kakurin, L. I.; Kotovskaya, A. R.; Maksimov, D. G.; Mikhaylovskiy, G. P.; Yazdovskiy, V. I.

TITLE: Results of physiological investigations aboard the "Vostok-3" and "Vostok-4" spaceships

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1063. Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine): materialy* konferentsii. Moscow, 1963, 6-8

TOPIC TAGS: biomedical monitoring, electrooculogram, pneumogram/Vostok-3, Vostok-4, EEG, EKG

ABSTRACT: A number of physiological indices were monitored during the tandem spaceflights of Nikolayev and Popovich (Vostok-3 and Vostok-4). New procedures used for the first time on these flights and improvements of existing equipment yielded a great deal of physiological information. Weightless-

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ACCESSION NR: AT4042642

ness had no noticeable effect on the functional state of the CNS in either cosmonaut, as evaluated on the basis of performance of various tasks. EEG's showed a dominance of comparatively high-amplitude rhythms with a frequency of 5 to 7 cps, similar to those observed in athletes after intense physical exertion, during the first hours of weightlessness. Later a gradual shift toward beta-rhythms with a reduced mean amplitude of EEG biopotentials occurred. Heightened emotional stress in the first hours of flight and before reentry was reflected in decreased electrical resistance of the cortex. Functional stability of the higher involuntary nervous centers is indicated by the maintenance of normal daily variation of cortical resistance--higher at night, lower during the daytime--during the rest of the flights. EOG's (electrooculograms) were used as an index of the functional state of the vestibular apparatus. Asymmetries in oculomotor reaction, which could have indicated disturbances of the vestibular centers, were not observed in either cosmonaut. Vestibular tests not supplemented by EOG's also failed to yield any evidence of vestibular disturbance. Oculomotor activity was also used as an index of general and motor activity. Variations in oculomotor activity had a phase character. At the beginning of the flight Nikolayev, and to

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a lesser degree Popovich, showed an increase of oculomotor activity up to 4 to 6 eye movements per second. Eye movements of an uncoordinated character, of both large and small amplitude, were recorded. On the 6th and 7th orbits eye movement fell off, and later EOG's show periodic increases and decreases in oculomotor activity. Toward the end of the flight a second stable increase in oculomotor activity occurred, but its level was lower than at the beginning of the flight. Cardiac activity was monitored by EKG's (using chest leads). Increased pulse rates (from 98 to 112 for Nikolayev, and from 94 to 136 for Popovich) occurred immediately before launch, with corresponding shortening of the PQ and QT intervals. EKG changes during the powered-flight phase were similar to those observed in ground experiments with centrifuging. The maximum pulse rate during the first minute of flight was 136 for Nikolayev and 132 for Popovich. Normalization of pulse rates to the rates observed 4 hr before launch took place on Nikolayev's 6th and 7th orbit and on Popovich's 3rd to 4th orbit. Normalization of pulse to initial rates took 5 to 10 min during tests. No IKG changes indicating disturbances of automatism, excitability, or conductivity were observed. In flight Popovich registered 3 separate extra

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systoles; this had also occurred during training tests. The character of daily variation of cardiac activity remained unchanged. Pneumographic data revealed no respiratory irregularities. Some increase in respiration rate was noted during the powered-flight phase; this had also been observed during centrifuge tests. No pathological change in physiological functions of either cosmonaut was observed during flight. During the powered-flight phase, functional shifts similar to those observed during centrifuge tests occurred. Definite changes in the functional state of various physiological systems took place during the first hours of orbital flight, as indicated by the inhibition of pulse-rate normalization and the character of EEG and cortical resistance changes. Changes in the character of EEG's during prolonged (3 to 4 days) weightlessnes indicate shifts in the interaction of excitation-inhibition processes in the higher levels of the CNS. However, the mental activity and neuro-regulatory functions of the cosmonauts remained at a high level.

ASSOCIATION: none

SUBMITTED: 27SEP63

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problems of creating space-

of the crew members.

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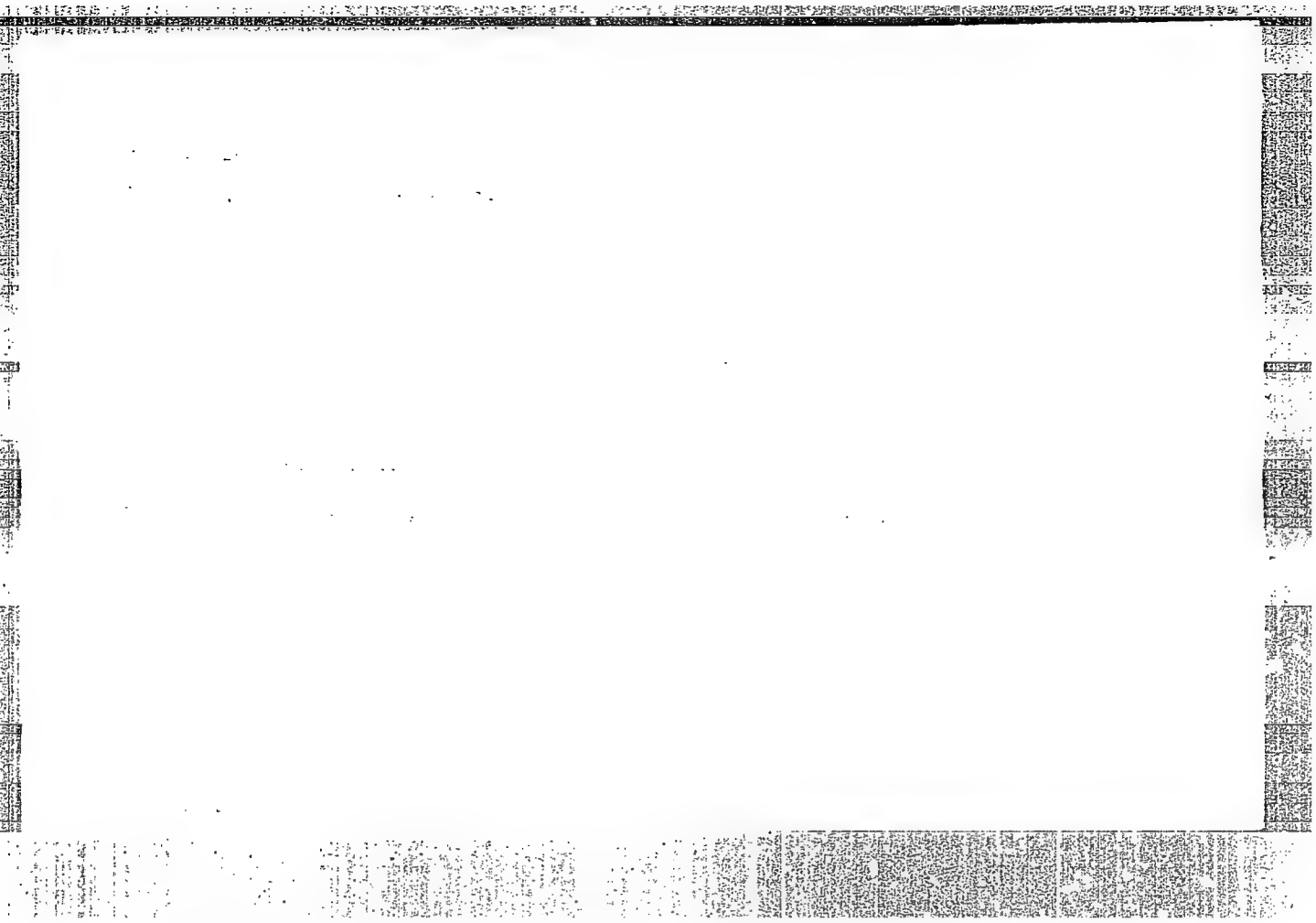

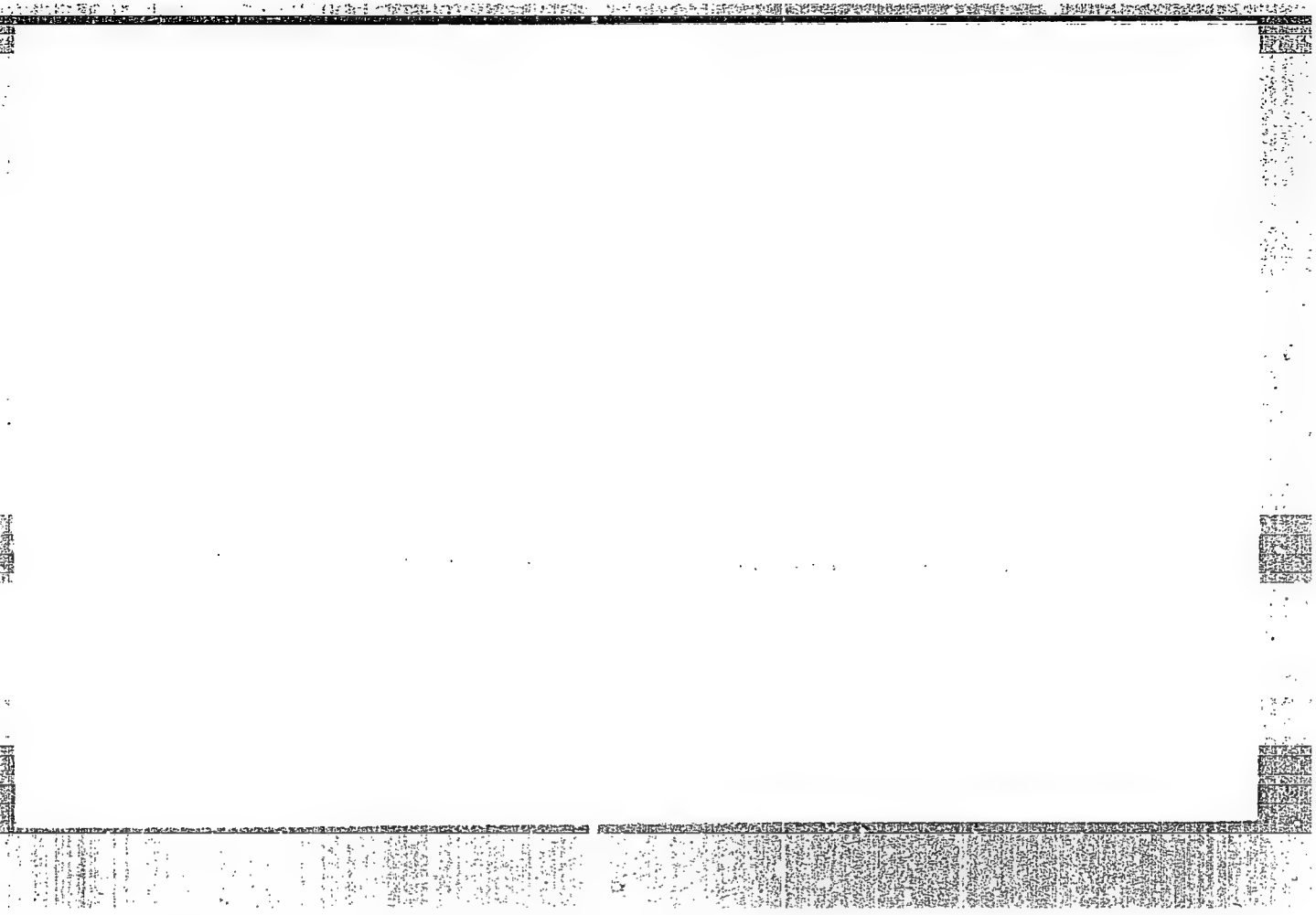

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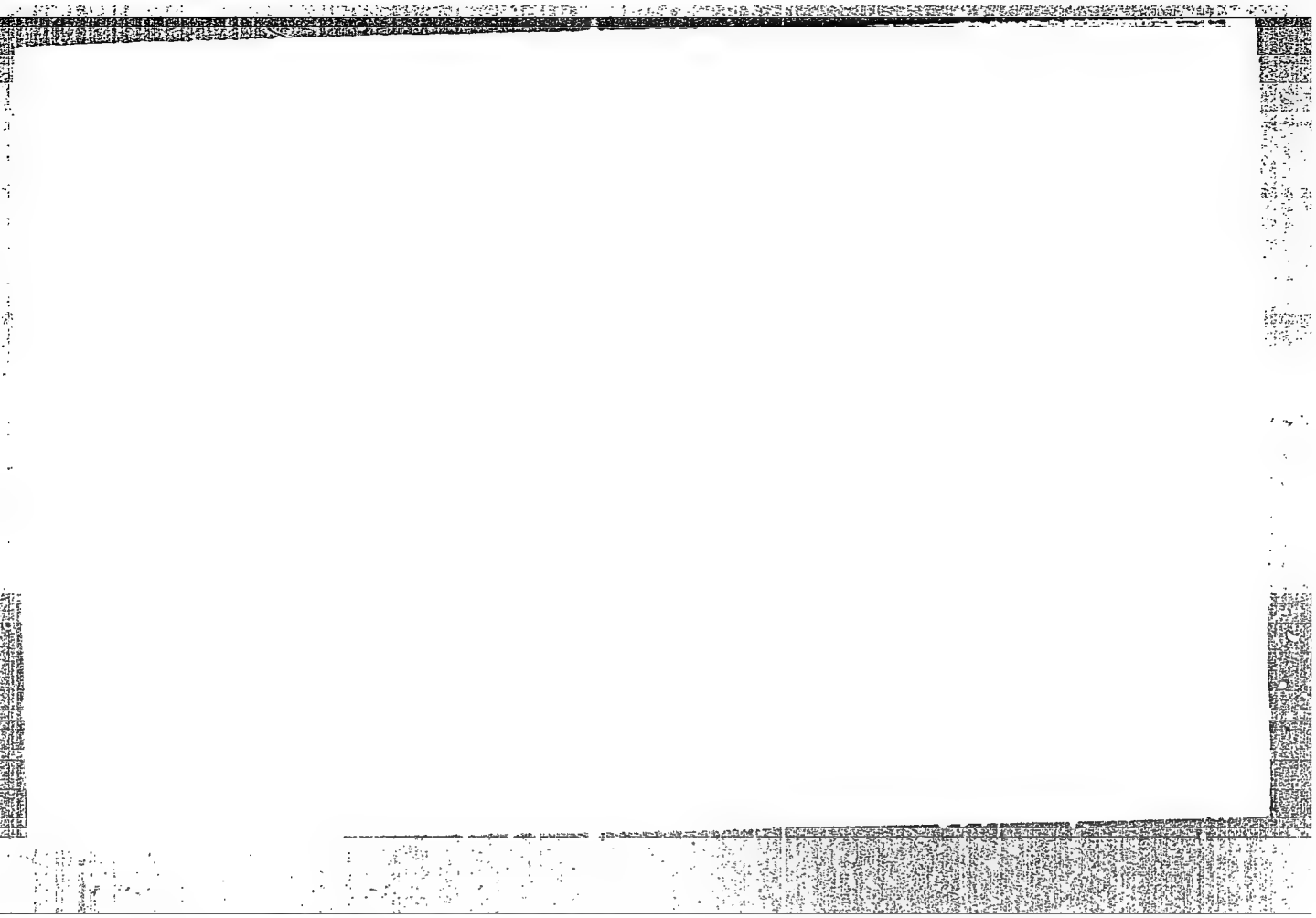

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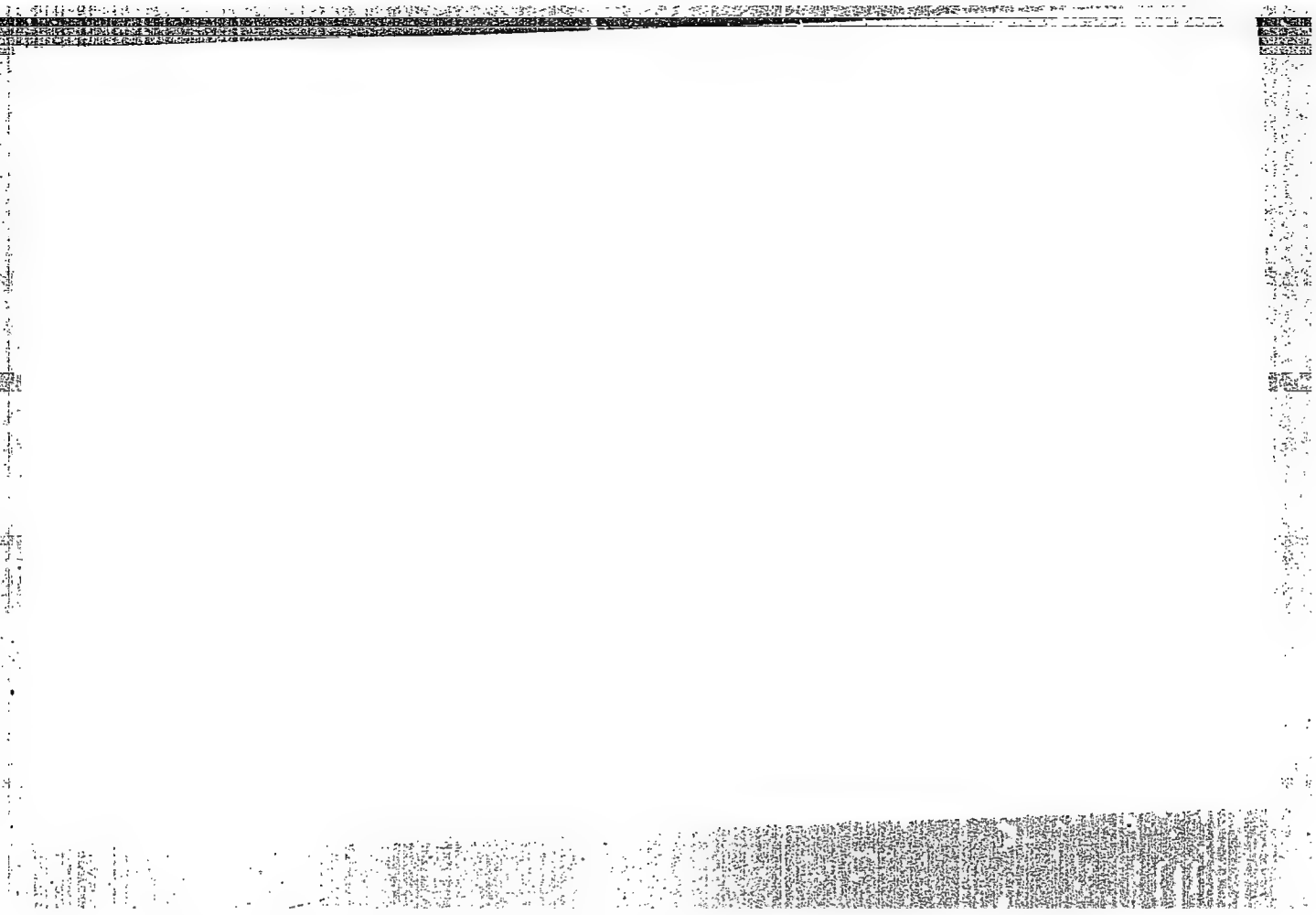
SIKAKYAN, N.M.; ANTIPOV, V.V.; SAMSONOV, I.I.; YAKOVLEVA, V.I.

Studies on the biological activity of cosmic radiation under space flight conditions. Radiobiologiia 4 no.3:333-34[illegible] (MIRA 17:11)

BLOKHIN, N.N.; VASIL'YEV, P.V., kand. biol. nauk; LEBEDINSKIY, A.V., prof. [deceased]; YAZDOVSKIY, V.I., doktor med. nauk, prof.; CHERNOV, A.G.; NIKOLAYEV, V.R., red.

[Man in a space ship. Eighth discussion. Participants in the discussion: N.N.Blokhin and others] Chelovek v kosmicheskom korable. Beseda vos'maia. V besede uchastvuiut: N.N.Blokhin i dr. Moskva, Znanie, 1965. 30 p. (Novoe v zhizni, nauke, tekhnike. VIII seriia: Biologiia i meditsina, no.7) (MIRA 18:4)

1. Deystvitel'nyy chlen, prezident AMN SSSR (for Blokhin).
2. Deystvitel'nyy chlen AMN SSSR (for Lebedinskiy).



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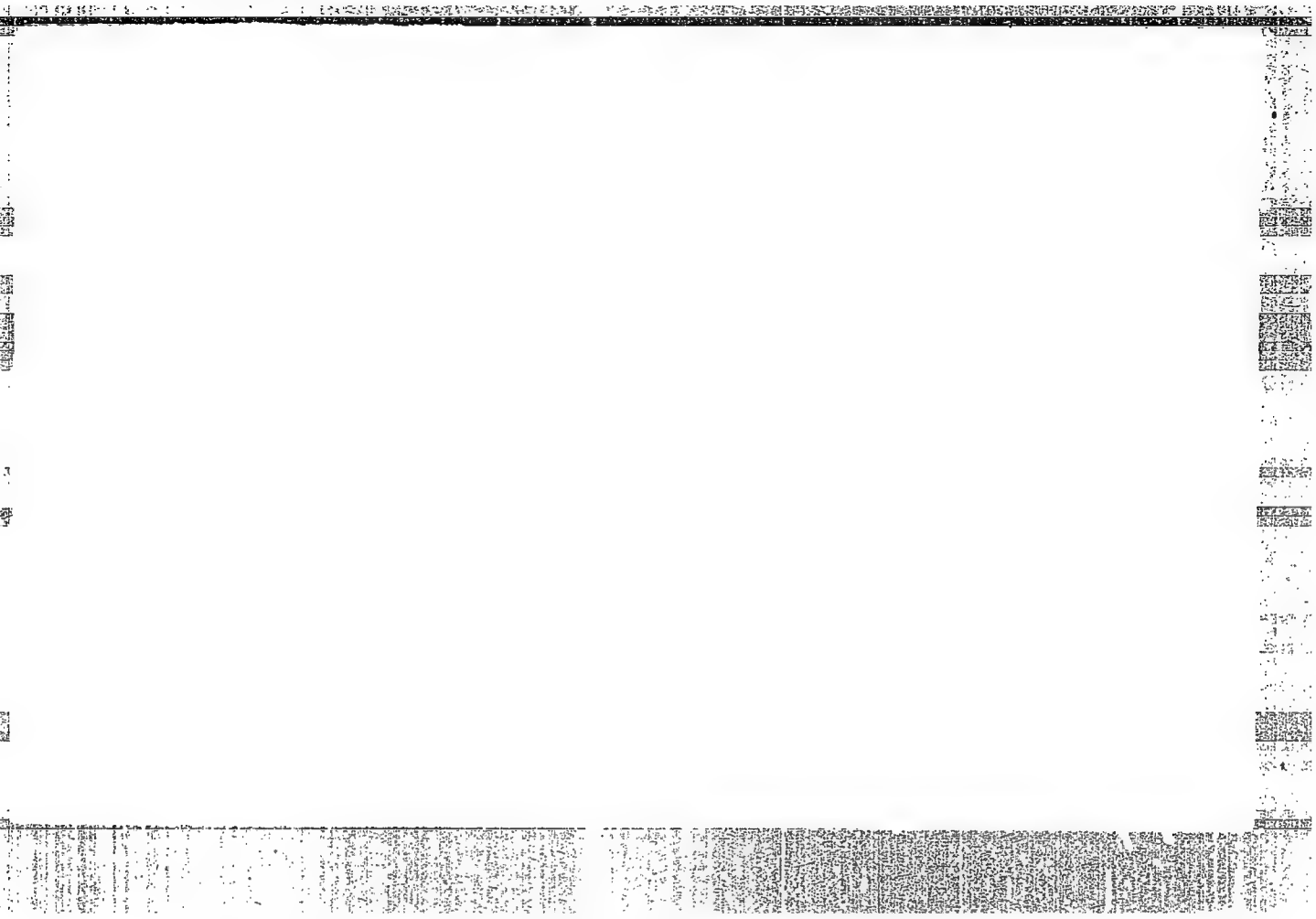

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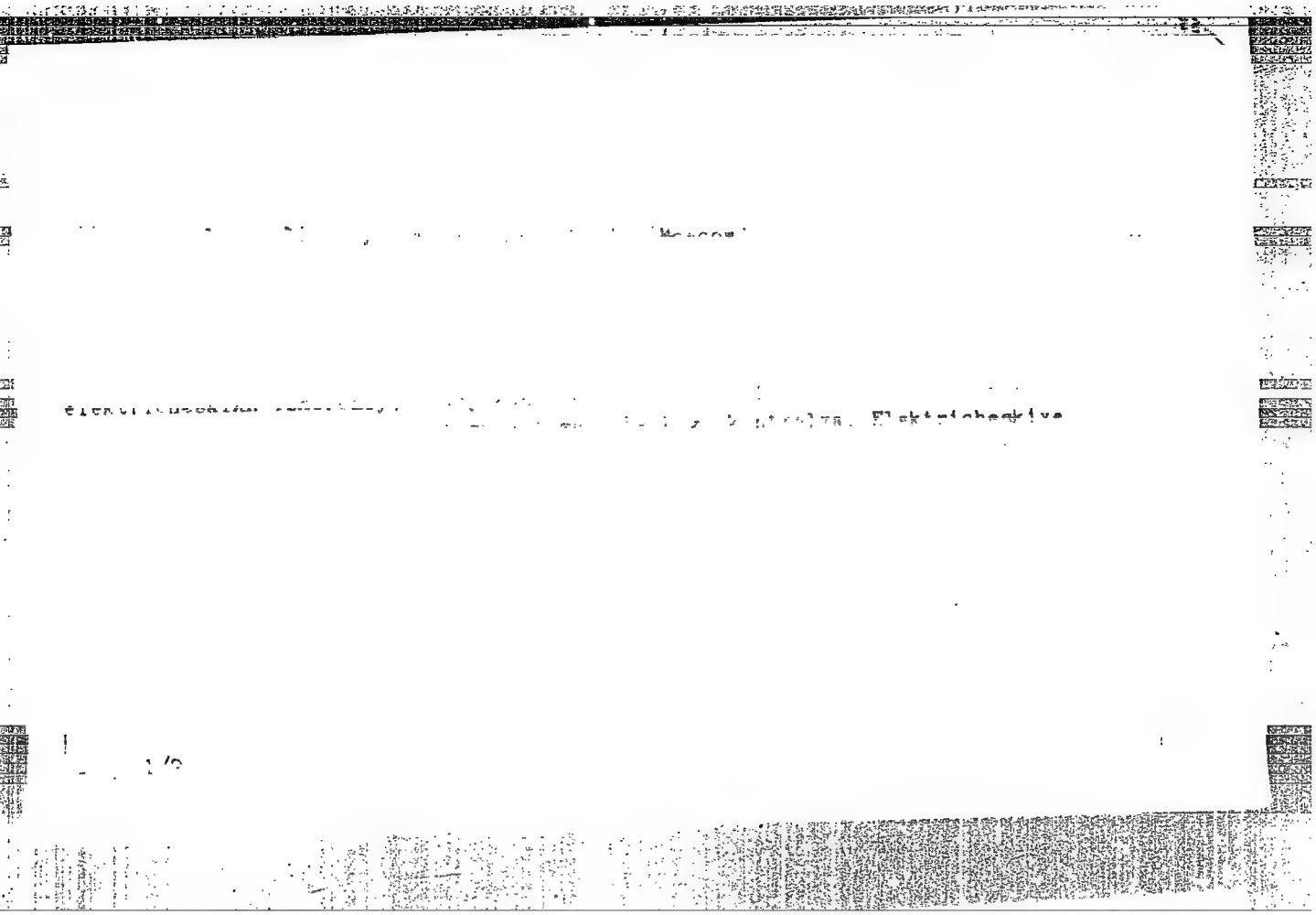
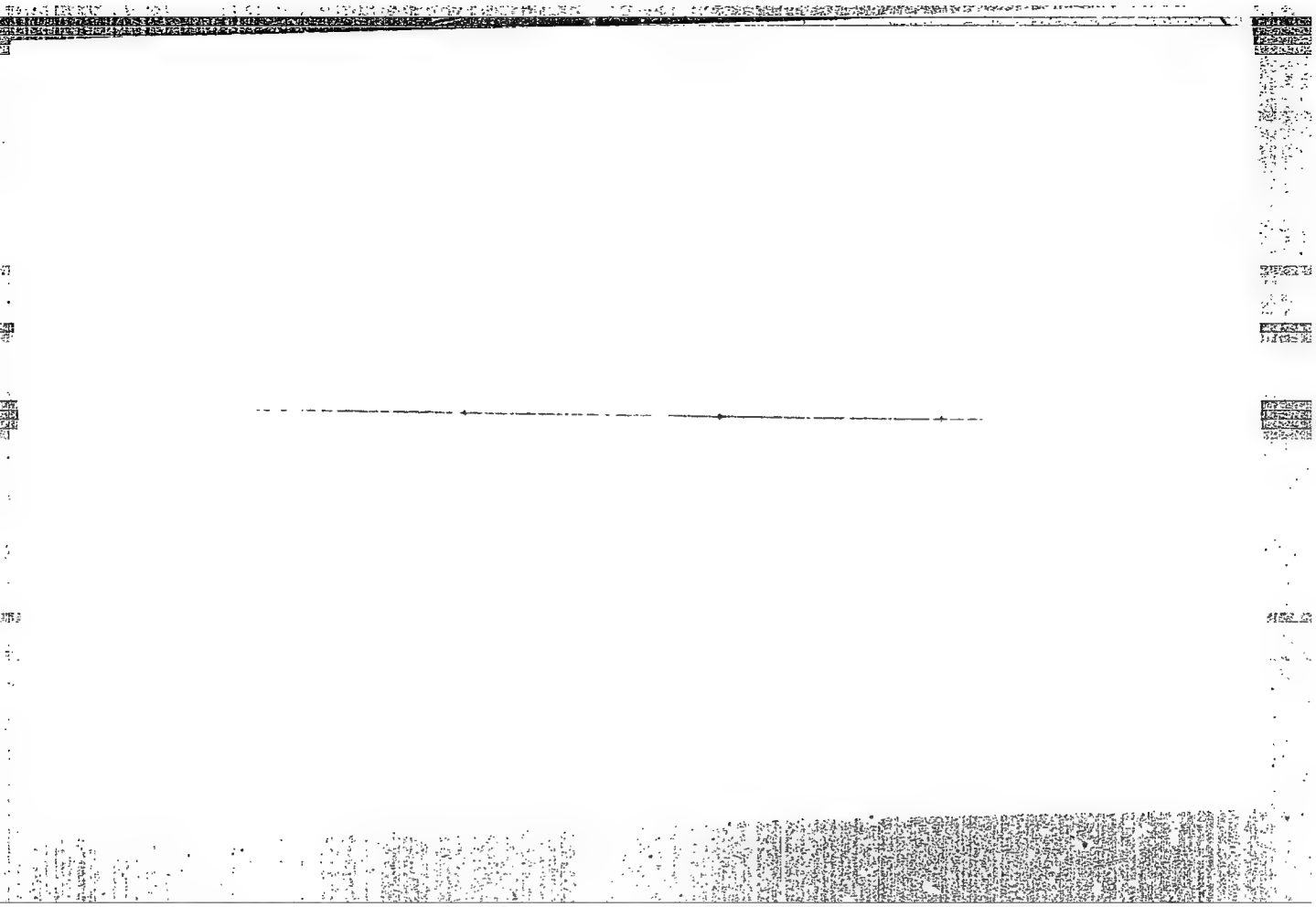


[redacted]

[redacted] basic difference is that the [redacted] positioned on the human



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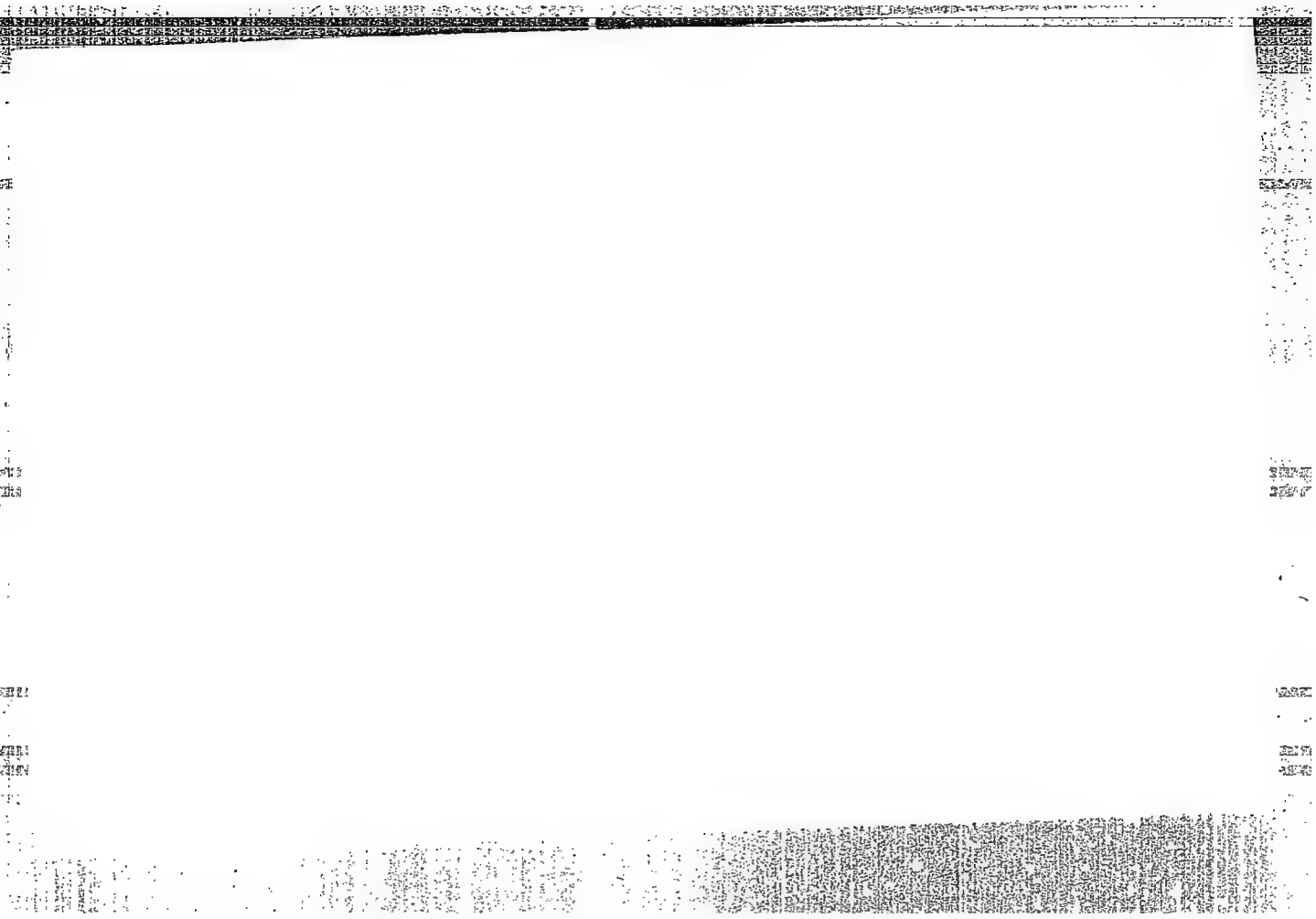

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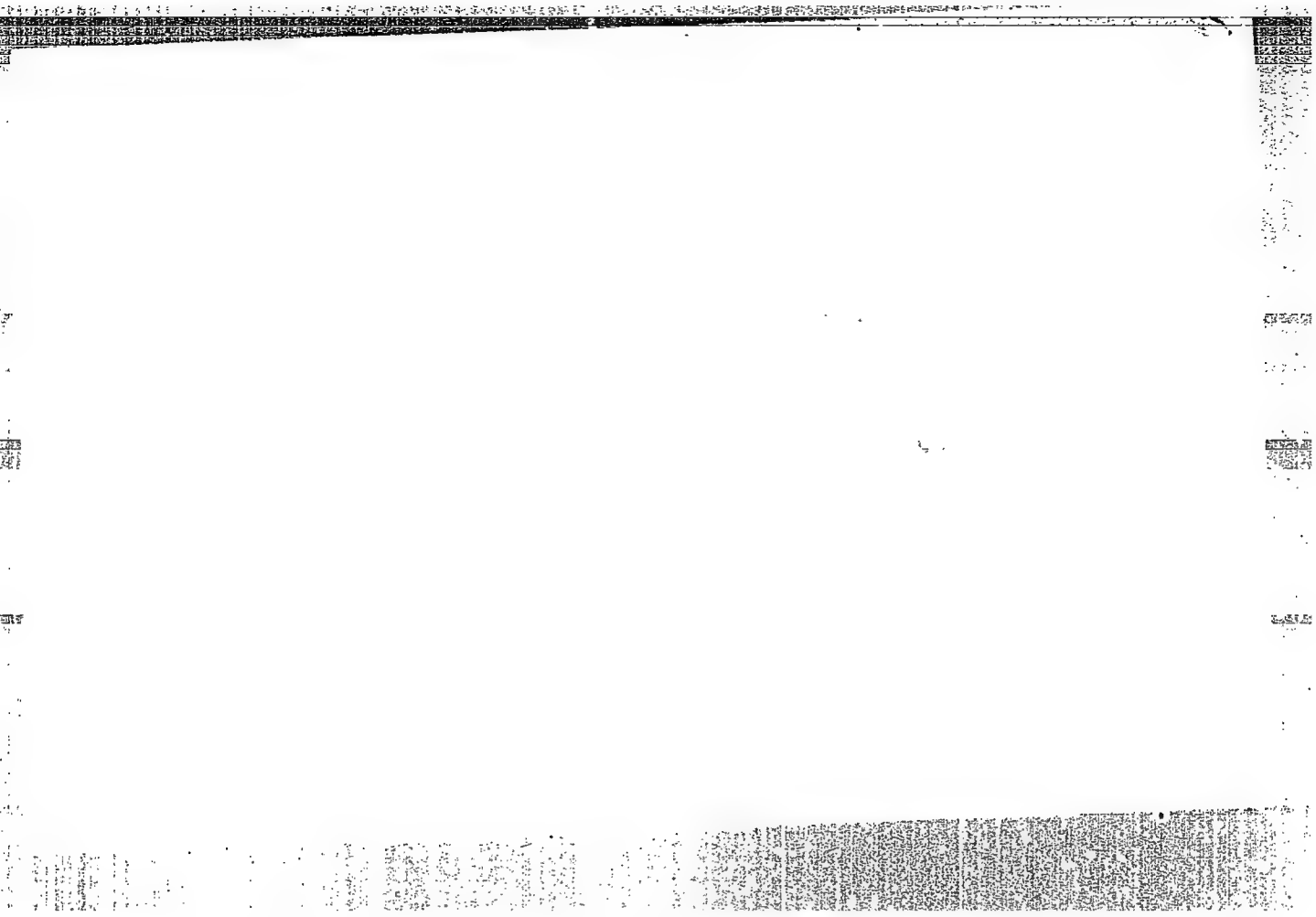

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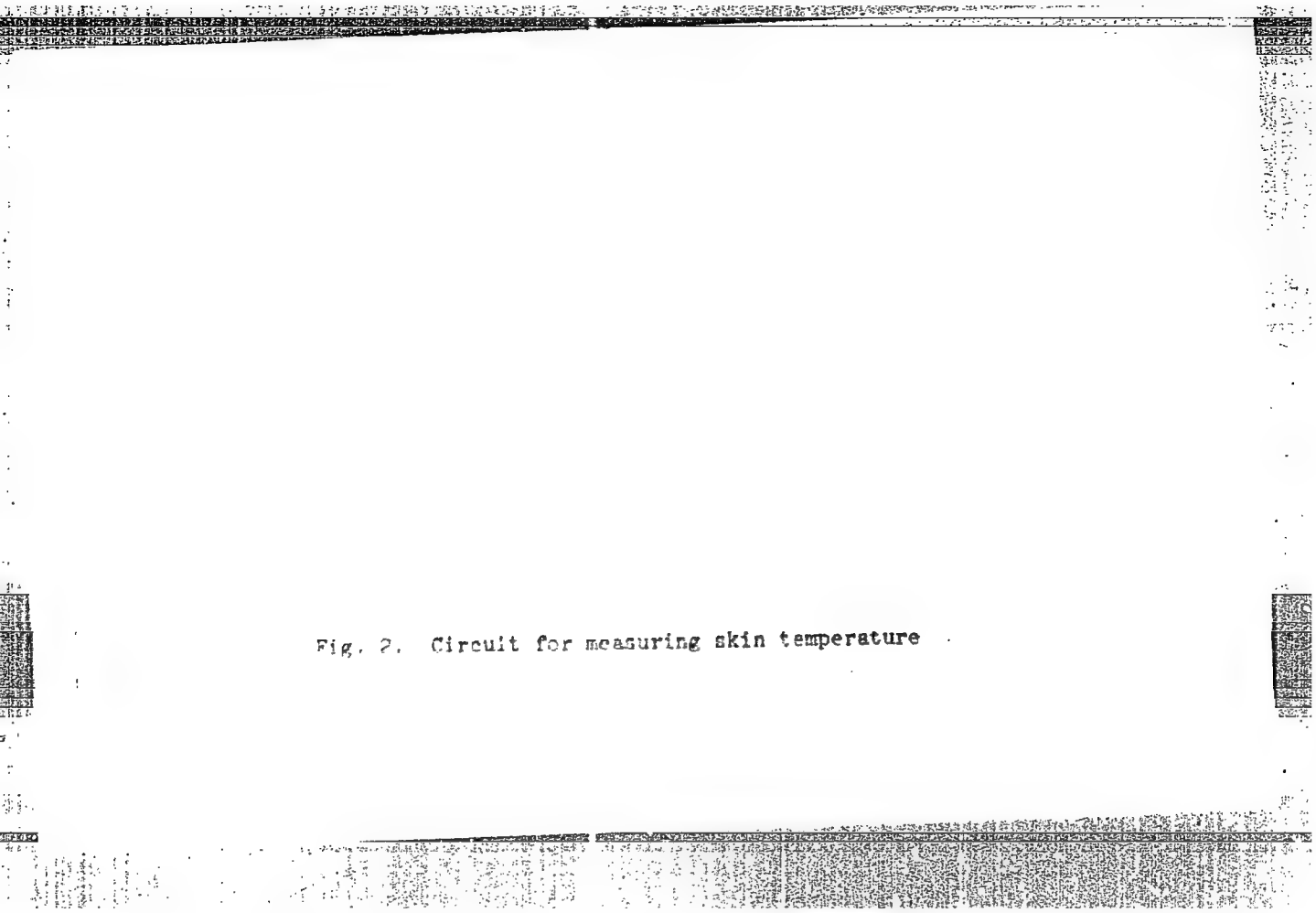
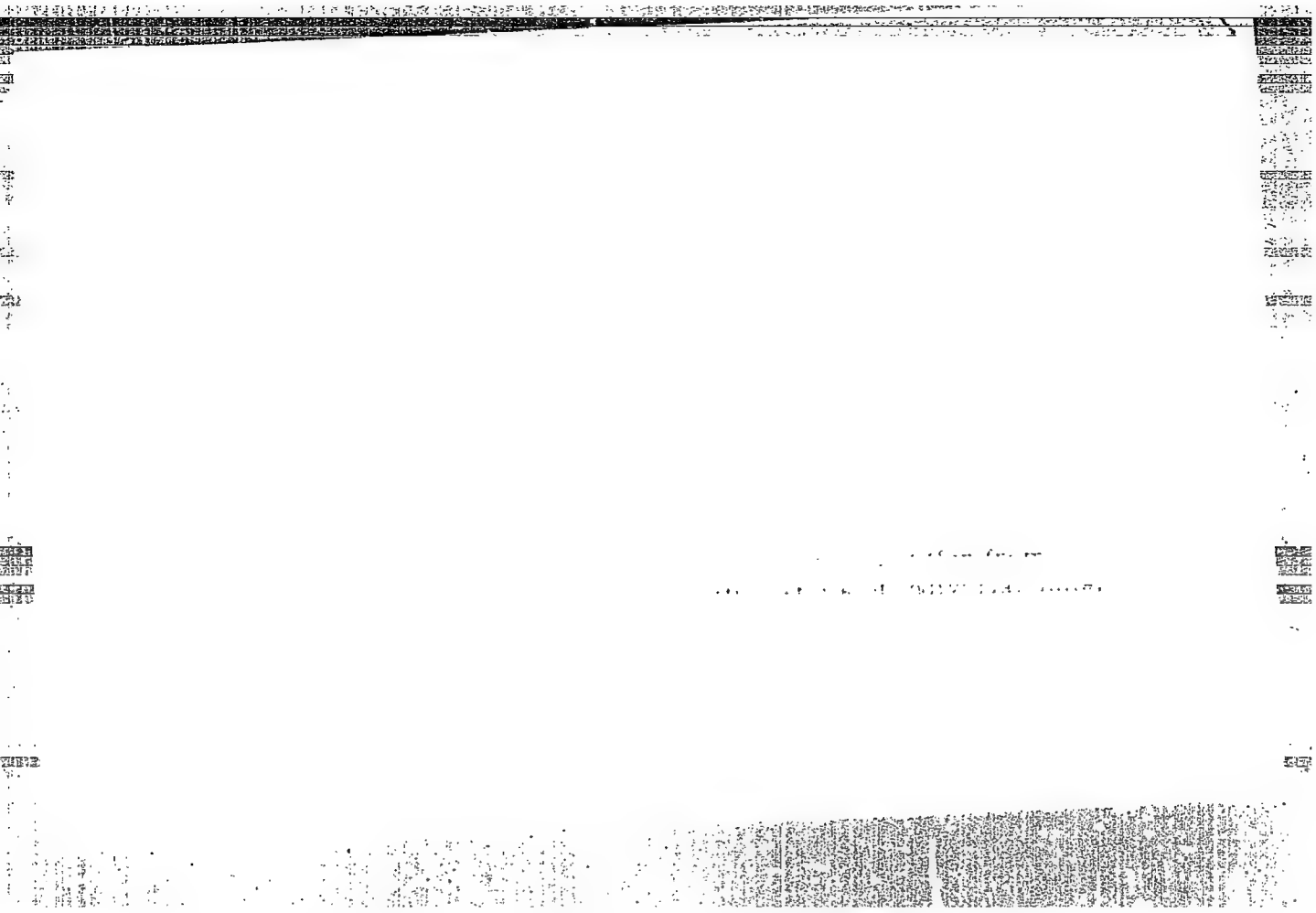


Fig. 2. Circuit for measuring skin temperature



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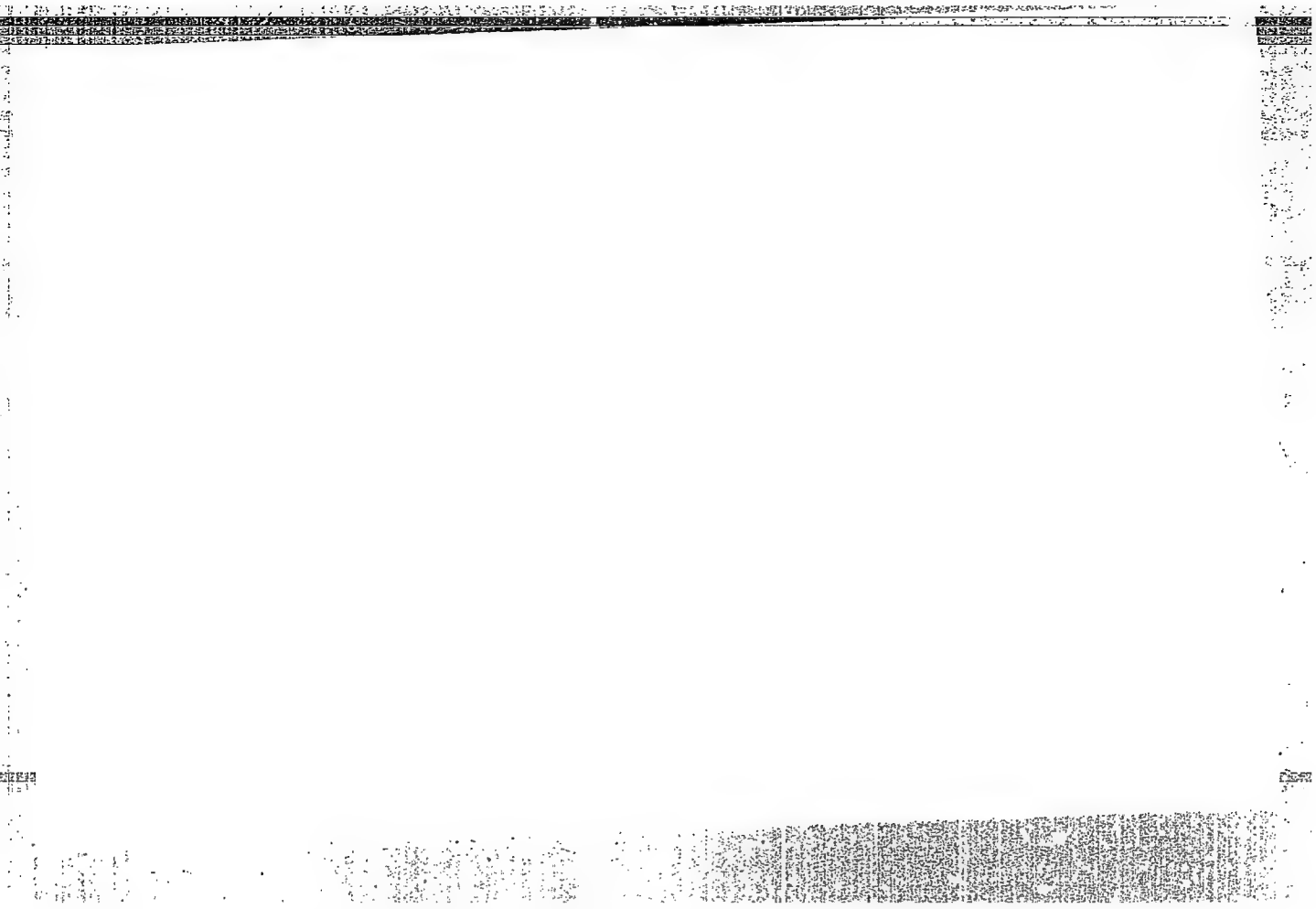

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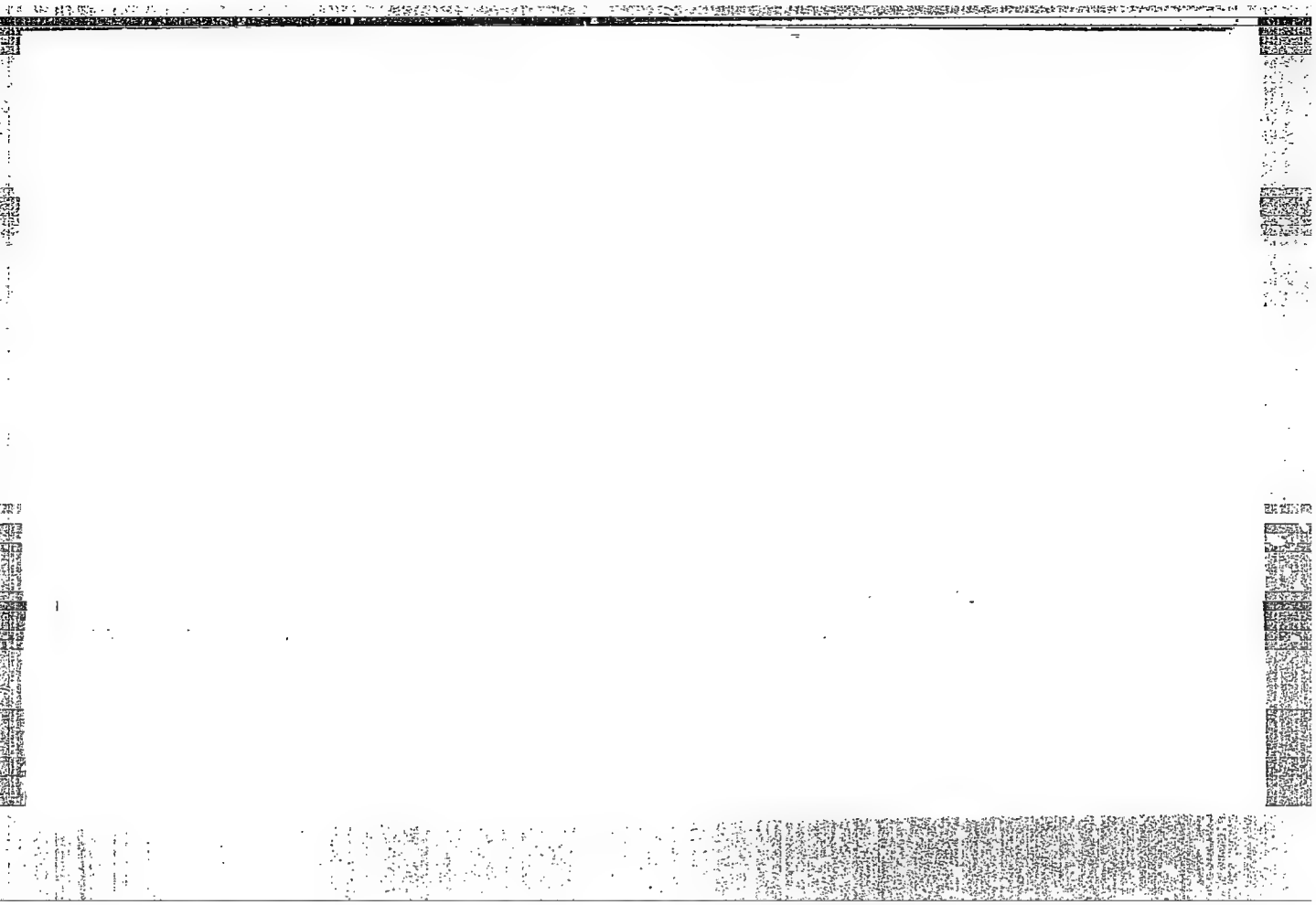

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L 63215-65 EEC-4/EED-2/EWG(c)/EWG(j)/EWG(r)/EEC(k)-2/EWG(v)/EWT(d)/EWT(1)/FS(v)-3/EWA(d)/FSS-2 Pe-5/Pg-4/P1-4/Pk-4/P1-4/Po-4/Pq-4/Pac-4/Pae-2 TT/RD/GW/GS

ACCESSION NR: AT5013041 UR/0000/64/002/000/0100/0105

AUTHOR: Bayevskiy, R. M. (Moscow); Voskresenskiy, A. D. (Moscow); Gazenko, O. G. (Moscow); Yegorov, A. D. (Moscow); Chekhonadskiy, N. A. (Moscow); Yazdovskiy, V. I. (Moscow)

TITLE: Measuring information systems in cosmic biology

SOURCE: Vsesoyuznaya konferentsiya po avtomaticheskomu kontrolyu i metodam elektricheskikh izmereniy. 4th, Novosibirsk, 1962. Avtomaticheskiy kontrol' i metody elektricheskikh izmereniy: trudy konferentsiy, t. 2: Teoriya izmeritel'nykh informatsionnykh sistem. Sistemy avtomaticheskogo kontrolya. Elektricheskiye izmereniya neelektricheskikh velichin (Automatic control and electrical measuring techniques: transactions of the conference, v. 2: Theory of information measurement systems. Automatic control systems. Electrical measurements of nonelectrical quantities). Novosibirsk, Redizdat Sib. otd. AN SSSR, 1964, 100-105

TOPIC TAGS: cosmic biology, information system

ABSTRACT: A general state-of-the-art discussion and a review based on six 1956-61 Soviet and ten 1959-62 American sources are presented. Two types —

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L 63245-65
ACCESSION NR: AT5013041

research and monitoring -- of measuring information systems have been used in cosmic biology. Block diagrams of telemetering biological data under laboratory and actual flight conditions are shown. Automatic data-processing systems are used for quick diagnosing of man's condition and situations. The effect of weightlessness on the autocorrelation function of G. S. Titov's pulse frequency is shown. Ways for using mathematical simulation of bio processes are figured out. The problems of reliability of equipment are discussed, as well as the "small telemetry" (between the astronaut and his ship-borne equipment). Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 17Nov64 ENCL: 00 SUB CODE: LS, SV

NO REF SOV: 006 OTHER: 010

Vostok 2

Card 2/2

GAZENKO, O.G.; KAS'YAN, I.I.; KOTOVSKAYA, A.R.; YUGANOV, Ye.M.; YAZDOVSKIY, V.I.

Physiological reactions of animals during their flight in the third, fourth and fifth spaceships. Izv. AN SSSR. Ser.biol. no.4:497-511 Jl-Ag '64. (MIRA 17:10)

DENISOV, V.G.; ZAV'YALOV, Ye.S.; KUZ'MINOV, A.P.; SIL'VESTROV, M.M.; YAZDOVSKIY, V.I.

Problems of engineering psychology in astronautics and some results of investigations. Kosm.issl. 2 no.5.783-796 S-O '64. (MIRA 17:10)

VOLYNKIN, Yu.M.; ARUTYUNOV, G.A.; ANTIPOV, V.V.; ALTUKHOV, G.V.; BAYEVSKIY, R.M.; BELAY, V.Ye.; BUYANOV, P.V.; BRYANOV, I.I.; VASIL'YEV, P.V.; VOLOVICH, V.G.; GAGARIN, Yu.A.; GENIN, A.M.; GORBOV, F.D.; GORSHKOV, A.I.; GUROVSKIY, N.N.; YESHANOV, N.Kh.; YEGOROV, A.D.; KARPOV, Ye.A.; KOVALEV, V.V.; KOLOSOV, V.A.; KORESHKOV, A.A.; KAS'YAN, I.I.; KOTOVSKAYA, A.R.; KALIBERDIN, G.V.; KOPANEV, V.I.; KUZ'MINOV, A.P.; KAKURIN, L.I ; KUDROVA, R.V.; LEBEDEV, V.I.; LEBEDEV, A.A.; LOBZIN, P.P.; MAKSIMOV, D.G.; MYASNIKOV, V.I.; MALYSHKIN, Ye.G.; NEUMYVAKIN, I.P.; ONISHCHENKO, V.F.; POPOV, I.G.; PORUCHIKOV, Ye.P.; SIL'VESTROV, M.M.; SERYAPIN, A.D.; SAKSONOV, P.P.; TERENT'YEV, V.G.; USHAKOV, A.S.; UDALOV, Yu.F.; FOMIN, V.S.; FOMIN, A.G.; KHLEBNIKOV, G.F.; YUGANOV, Ye.M.; YAZDOVSKIY, V.I.; KRICHAGIN, V.I.; AKULINICHEV, I.T.; SAVINICH, F.K.; STMPURA, S.F.; VOSKRESENSKIY, O.G.; GAZENKO, O.G., SISAKYAN, N.M., akademik, red.

[Second group space flight and some results of the Soviet astronauts' flights on "Vostok" ships; scientific results of medical and biological research conducted during the second group space flight] Vtoroi gruppovoi kosmicheskii polet i nekotorye itogi poletov sovetskikh kosmonavtov na korabliakh "Vostok"; nauchnye rezul'taty medikobiologicheskikh issledovanii, provedennykh vo vremia vtorogo gruppovogo kosmicheskogo poleta. Moskva, Nauka, 1965. 277 p. (MIRA 18:6)

VOSKRESENSKIY, A.D.; GAZENKO, O.G.; IZOSIMOV, G.V.; MAKSIMOV, D.G.; YAZDOVSKIY, V.I.; KOPANEV, V.I.

Some physiological data for the evaluation of the state and efficiency of astronauts in orbital flights. Probl. kosm. biol. 4:227-236 '65. (MIRA 18:9)

YAZDOVSKIY, V.I.; YEMEL'YANOV, M.D.; VASIL'YEV, P.V.; KOPANEV, V.I.

Some results of medical and biological studies conducted during training and flight of the astronauts. Probl. kosm. biol. 4:237-247 '65. (MIRA 18:9)

L 14277-66 FSS-2/EWT(1)/FS(v)-3 DD/RD

ACC NR: AT6003861 SOURCE CODE: UR/2865/65/004/000/0270/0289

AUTHOR: Kas'yan, I. I.; Kopanev, V. I.; Yazdovskiy, V. I.

ORG: none

TITLE: Reactions of cosmonauts to conditions of weightlessness

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii, v. 4, 1965, 270-289

TOPIC TAGS: manned spaceflight, weightlessness, space physiology, biologic respiration, cosmonaut, physiological parameter, EKG

ABSTRACT: The authors review and consolidate data obtained from the flights of Vostoks 2-6. These data are given in the enclosed graphs and tables. The authors conclude that an important future experimental problem will be to establish the optimum magnitude of artificial gravity which will overcome the deleterious effects of weightlessness during prolonged manned spaceflights. Orig. art. has: 5 figures and 8 tables. [ATD PRESS: 4091-F]

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L 14277-66

ACC NR: AT6003861

Table 1. Change in pulse rate (beats/min) during various Vostok flight stages under conditions of weightlessness (average)

Flight stage			Vostok - 2, G. S. Titov				Vostok - 3, A. G. Nikolayev				Vostok - 4, P. R. Popovich				Vostok - 5, V. F. Bykovskiy				Vostok - 6, V. V. Tereshkova			
			M	σ	C	% P	M	σ	C	% P	M	σ	C	% P	M	σ	C	% P	M	σ	C	% P
Prelaunch (P), 5 min			100,0	7,31	8,85	100,0	117,0	7,10	6,12	100,0	107,0	7,00	6,55	100,0	132,8	12,77	9,62	100,0	111,0	6,37	5,61	100,0
Weightlessness	2nd of 1st day	1	101,0	9,85	9,17	100,0	122,0	6,27	5,09	113,2	101,0								111,0	6,37	5,61	100,0
		7	92,0	8,72	10,63	77,4	78,0	3,20	4,10	69,8									58,0	3,63	5,55	58,8
	2nd. day	13	89,0	9,31	10,85	81,0	85,0	6,32	9,14	78,6	62,0	2,56	3,97	59,9	71,0	2,56	4,08	17,7	95,0	11,03	11,67	71,4
		17	97,0	12,21	12,62	96,5	79,0 (16)	11,37	14,39	70,5	60,0	5,62	9,45	51,3	70,0	7,30	10,37	53,0	68,0	6,47	9,56	51,1
		23					65,0	7,73	11,90	58,0	60,0	1,95	3,11	52,7	61,0	4,72	7,73	55,4	61,0	3,92	6,35	45,8
	3rd day	29					65,0 (37)	2,88	5,11	58,0	50,0	7,11	17,61	50,1	50,0	5,69	11,38	37,9	78,0	9,22	11,96	58,6
		33					81 (32)	8,51	9,57	69,7	53,0 (31)	7,00	5,04	51,3	56,0 (16)	3,14	6,02	42,4	69,0	4,83	5,91	51,9
		39					73,0	8,21	11,24	65,2	56,0	2,96	5,32	47,9	61,0	3,91	8,22	37,0	61,0	11,78	18,43	48,1
	4th day	45					72,0	2,70	3,75	61,5	61,0 (38)	1,77	2,90	58,1	58,0	2,09	4,31	33,9	70,0	2,82	4,04	53,6
		51					67,0	3,71	5,54	58,8					58,0	3,96	6,82	41,9				
		55					61,0	2,53	3,97	57,1					70	5,19	7,74	53,0				
	5th day	61					71,0 (62)	5,60	7,97	60,4					57,0	5,06	8,88	43,2				
		67													61,0	4,84	8,01	46,2				
		73													61,0	4,82	7,90	46,2				
	Beginning of 6th day	78													61,0	4,14	7,55	46,2				
		81													72,0	5,52	7,77	54,3				

Note: M- mean arithmetic; σ - mean quadratic error; C - variation coefficient

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ACC NR: AT6003861

Table 2. Changes in respiration rate (cycles/min) during various Vostok flight stages under conditions of weightlessness (average)

Flight Stage			Vostok - 2, G. S. Titov				Vostok - 3, A. G. Nikolayev				Vostok - 4, P. R. Popovich				Vostok - 5, V. F. Bykovsk				Vostok - 6, V. V. Tereshkova			
			M	σ	C	Σ P	M	σ	C	Σ P	M	σ	C	Σ P	M	σ	C	Σ P	M	σ	C	Σ P
Prelaunch (P), 5 min			19,61	1,83	39,28	100,0	9,67	1,31	13,55	100,0	15,17	2,62	17,17	100,0	16,83	1,89	75,57	100,0	17,78	2,27	12,82	100,0
Weightlessness	End of 1st day	1					13,71	2,88	20,80	141,8	19,14	3,18	16,61	126,2	21,75	2,47	22,12	111,0	20,25	3,11	15,29	116,0
		7	13,00	2,23	16,34	69,4	11,44	2,01	17,58	118,3	-	---	---	---	16,60	2,07	12,49	75,6	21,29	2,69	12,35	123,1
	2nd day	13	16,17	3,31	23,01	82,4	11,00	1,70	16,34	113,8	18,20	2,06	11,32	120,0	18,01	2,71	15,04	107,0	22,50	3,10	13,82	130,3
		17	16,61	3,01	18,15	81,7	11,28 (16)	1,58	13,01	116,6	17,48	1,59	21,23	115,2	19,70	2,01	10,43	115,2	21,85	2,95	13,70	126,8
		23					10,88	3,11	28,84	112,5	16,35	0,82	5,01	101,0	21,75	2,49	12,34	126,3	21,00	1,15	5,05	121,5
	3rd day	29					7,3 (29)	1,12	21,01	77,36	15,05	2,16	23,07	98,9	11,00	2,83	20,31	61,3	21,80	1,45	6,80	120,1
		33					11,1 (31)	2,80	20,0	111,7	15,23 (31)	2,83	18,58	100,5	19,0 (33)	1,35	10,72	112,9	21,51	2,60	12,65	120,3
		39					12,40	2,85	22,91	128,2	11,00	2,76	25,11	98,0	18,54	1,62	8,73	110,2	21,36	1,97	9,16	121,6
	4th day	45					10,8	2,11	22,71	109,6	16,31 (50)	2,80	15,95	107,6	18,43	2,45	35,51	103,3	19,87	3,86	29,81	111,4
		51					13,0	3,24	24,92	131,1					18,20	2,61	15,46	101,7				
		56					11,7	2,78	23,75	120,0					18,25	1,75	8,82	103,6				
	5th day	61					9,75 (63)	2,51	23,74	100,8					17,00	1,41	8,31	101,0				
		67													18,88	2,56	13,46	112,0				
		71													19,17	2,49	7,78	113,9				
	Beginning of 6th day	78													13,6	2,15	18,61	80,2				
		81													17,56	2,49	13,91	101,5				

Note: M - mean arithmetic; σ - mean quadratic error; C - variation coefficient

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L 14277-66

ACC NR: AT6003861

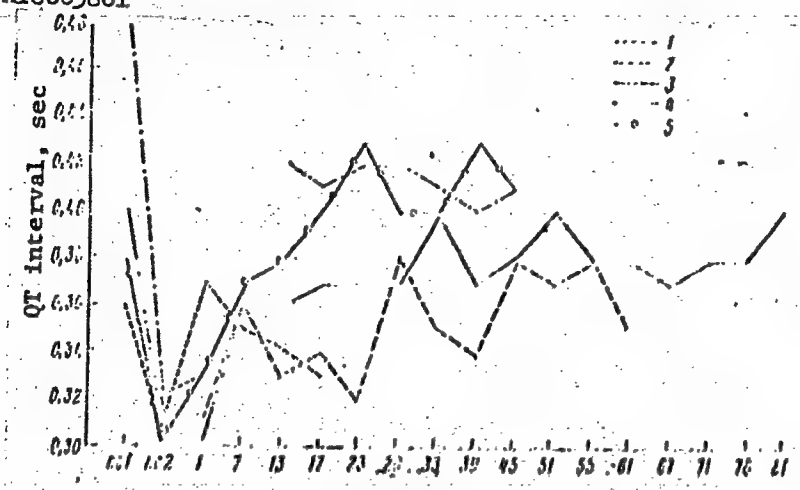

Fig. 1. Change in the duration of the EKG QT interval in Vostok cosmonauts
1 - Vostok-2, G. S. Titov; 2 - Vostok-3, A. G. Nikolayev;
3 - Vostok-4, P. R. Popovich; 4 - Vostok-5, V. F. Bykovskiy;
5 - Vostok-6, V. V. Tereshkova.

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L 14277-66
ACC NR: AT6003861

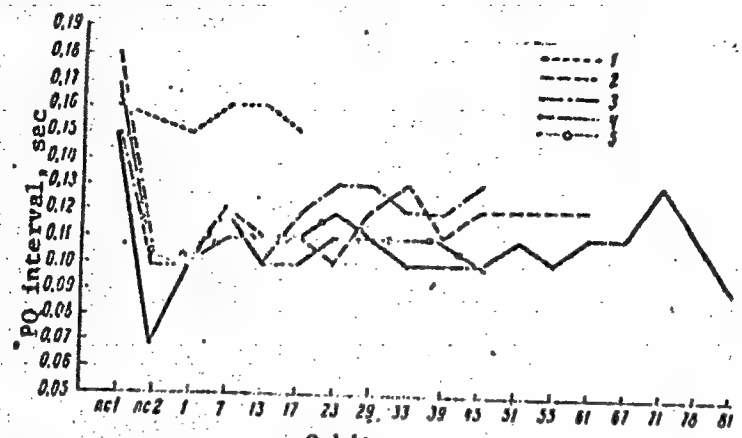

Fig. 2. Change in the duration of the EKG PQ interval in Vostok cosmonauts

1 - Vostok-2, G. S. Titov; 2 - Vostok-3, A. G. Nikolayev; 3 - Vostok-4, P. R. Popovich; 4 - Vostok-5, V. F. Bykovskiy; 5 - Vostok-6, V. V. Tereshkova.

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L 14277-66

ACC NR: AT6003861

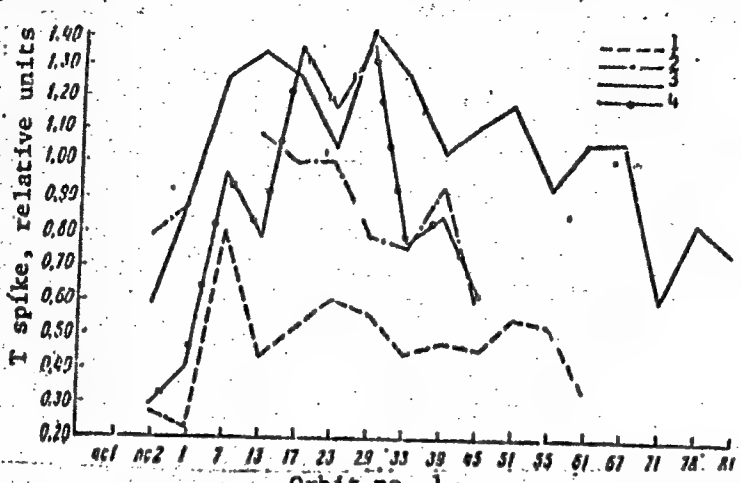

Fig. 3. Change in the amplitude of the EKG T spike in Vostok cosmonauts

1 - Vostok-3, A. G. Nikolayev; 2 - Vostok-4, P. R. Popovich; 3 - Vostok-5, V. F. Bykovskiy; 4 - Vostok-6, V. V. Tereshkova.

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L 14277-66

ACC NR: AT6003861

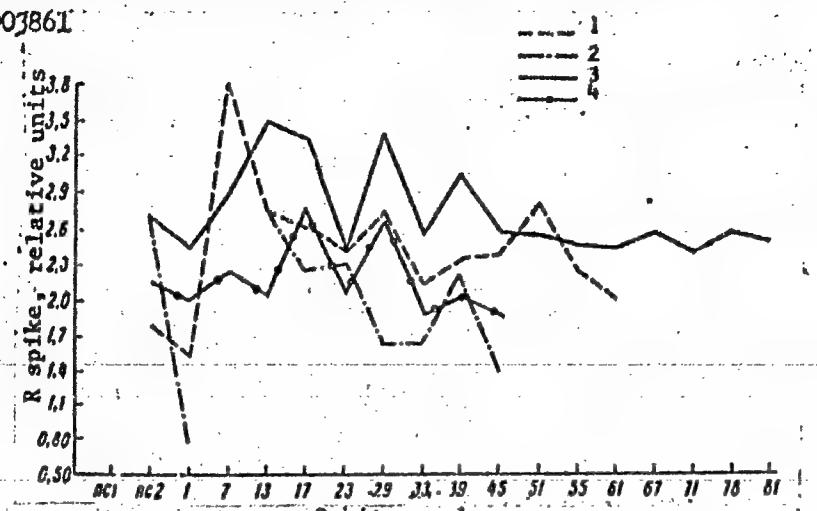

Fig. 4. Change in the amplitude of the EKG R spike in Vostok cosmonauts

1 - Vostok-3, A. G. Nikolayev; 2 - Vostok-4, P. R. Popovich; 3 - Vostok-5, V. F. Bykovskiy; 4 - Vostok-6, V. V. Tereshkova.

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L 14277-66

ACC NR: AT6003861

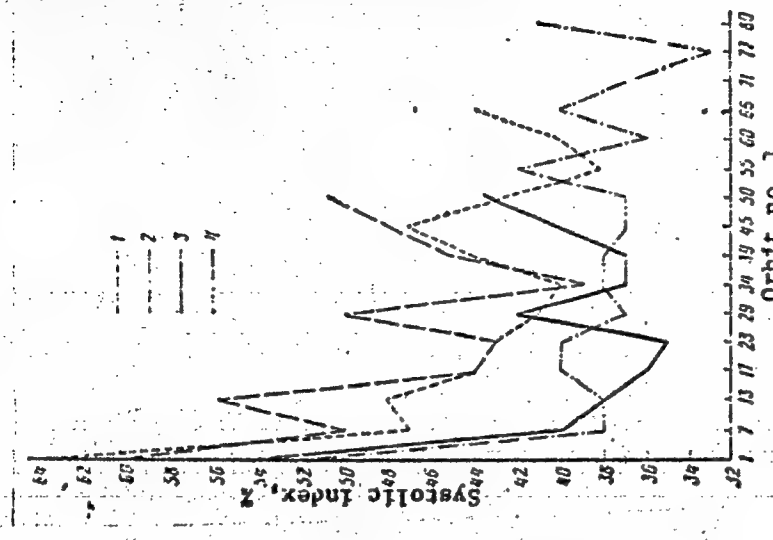

Fig. 5. Change in the systolic index of Vostok Cosmonauts

1 - Vostok-3, A. G. Nikolayev;
2 - Vostok-4, P. R. Popovich;
3 - Vostok-5, V. F. Bykovskiy;
4 - Vostok-6, V. V. Tereshkova

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L 14277-66
ACC NR: AT6003861

SUB CODE: 06 / SUBM DATE: none / ORIG REF: 027 / OTH REF: 018

Card 9/9

39

L 14246-66 RD

ACC NR: AT6003857 SOURCE CODE: UR/2865/65/004/000/0227/0236

AUTHOR: Voskresenskiy, A. D.; Gazenko, O. G.; Izosimov, G. V.; Kopanev, V. I.; Maksimov, D. G.; Yazdovskiy, V. I.

ORG: none

TITLE: Some physiological data for evaluating the condition and work capacity of cosmonauts under conditions of orbital flight

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii, v. 4, 1965, 227-236

TOPIC TAGS: manned spaceflight, EEG, skin, cosmonaut, space psychology, brain, biosensor, bodily fatigue, vision

ABSTRACT: This paper presents some graphic results of biomedical data from the Vostok-5 (V. F. Bykovskiy) and Vostok-6 (V. V. Tereshkova) flights. These include records of EEG's, EOG's, and skin galvanometry.

In summing up these data, the authors observed that a distinguishing feature of brain bioelectricity during the first hours and days of the flight was the increase in the index of high-frequency oscillations. No increase in the index of low-frequency oscillations was observed. Also characteristic of the initial flight period were elevated oculomotor activity and a rise in the

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L 14246-66

ACC NR: AT6003857

number of rapid variations in cutaneous electrical resistance per unit of time. These reactions probably reflected the emotional state associated with initial flight stages. Such factors as radio communications with ground control points and between spacecraft, the reception of commands and signals, and observation of the surface of the Earth and other heavenly bodies act as powerful stimuli eliciting a high level of psychoemotional reactions.

The process of adaptation to flight conditions was reflected in EOG and skin galvanometric indices, in that oculomotor activity and the mean number of rapid variations in the skin galvanic reaction showed significant decreases.

It is felt that the EEG, EOG, and skin galvanometric data from Vostok-5 and -6 reflected the psychoemotional adaptation of Bykovskiy and Tereshkova to prolonged spaceflight. EEG changes and a sharp decrease in oculomotor activity can act as prognostic indices of progressive fatigue. EOG data can be used to judge the effect of weightlessness on the function of the vestibular analyzer. However, it is noted that changes in all of the indices during the spaceflight did not correspond to subjective feelings of fatigue, vestibular symptoms, or a noticeable decrease in working ability. Orig. art. has: 3 figures. [ATD PRESS: 4091-F]

SUB CODE: 06 / SUBM DATE: none / ORIG REF: 012 / OTH REF: 003

Card 2/2 FW

L 23975-66 FSS-2/EWT(1)/EEC(k)-2/EWA(d) SCTB TT/DD/RD/GW

ACC NR: AT6003858 SOURCE CODE: UR/2865/65/004/000/0237/0247

AUTHOR: Yazdovskiy, V. I.; Yemel'yanov, M. D.; Vasil'yev, P. V.; Kopanev, V. I.

ORG: none

TITLE: Some results of medicobiological studies conducted during preparation and flight of the astronauts V. F. Bykovsk and V. V. Tereshkova

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii, v. 4, 1965, 237-247

TOPIC TAGS: space medicine, space medicine equipment, space physiology, astronaut

ABSTRACT: The program of study is described and results of medical observations during June 14-19, 1963 are reported. The study program includes the long term effect of cosmic flight on the human organism, psychophysiologic capacities and working capacity of humans under such conditions, reactions of the female organism, the 24 hour physiologic processes during cosmic flight, effectiveness of methods for selecting and training astronauts, analysis of the medical-biological monitoring system in the cabin, the microclimate of the spaceship, and the

Card 1/2

L 25975-66

ACC NR: AT6003858

effectiveness of systems providing for survival and safety. In selecting astronauts the compensatory work of the organism was most important. Under simulated cosmic conditions, women were seen to react least during the proliferative phase of the ovarian cycle, with some reaction during ovulation. Training increased resistance to the effect of cosmic factors and strengthened will power and the neuropsychic system. Radiation was low; the dosimeters showed about 80 and 44 millirad respectively. The astronauts received food in amounts of 2500-2900 calories per day. The microclimate in the cabin was satisfactorily maintained as to temperature, pressure and oxygen (13-26°C, 250-60% humidity, 22-28% oxygen, to 0.50% CO_2 and 740-780 mm Hg pressure). Medical controls included ECG, EEG, skin galvanic reaction, respiratory and pulse rates, tests for vestibular and vegetative insufficiency and observation by television. Before and at the start of flight the respiratory and pulse rates increased from 68 and 84 to 137 and 144, during the first minutes of flight they increased to 154 and 157, and then they returned to normal after several hours. The EEG showed a tendency for substitution of low frequency waves and a later decrease of amplitude of bioelectric rhythms; in the woman an increase of low frequency potentials was seen. Adaptation to weightlessness was good. All medical and biological control systems worked satisfactorily. It is concluded that a 5 day flight for men and 3 days for women is fully feasible without pathologic reactions. Orig. art. has: none

SUB CODE: 06/ SUBM DATE: none */[ADDITIVE WORD] Vostok 5 12 Vostok 6 12

Card 2/2 FV

ACC NR: AT7011648 SOURCE CODE: UR/0000/66/000/000/0001/0007

AUTHOR: Yazdovskiy, V. I.; Tsitovich, S. I.; Agre, A. L.; Gusarov, B. G.; Sinyak, Yu. Ye.; Chizhov, S. V.

ORG: none

TITLE: Transformation of wastes in a closed ecological system

SOURCE: International Astronautical Congress. 17th, Madrid, 1966. Doklady. no. 10. 1966. O transformatsii produktov zhiznedeyatel'nosti cheloveka i biokompleksa pri osushchestvlenii krugovorota veshchestv v malykh zamknutykh prostranstvakh, 1-7

TOPIC TAGS: life support system, metabolic waste, closed ecology system

ABSTRACT:
Successful operation of life-support systems based on partial recycling of substances depends on mineralization of human wastes and other life-support system byproducts, such as refuse from the space greenhouse, garbage, etc. Biological, physical and chemical methods of mineralization can be used alone or in combination. Criteria for judging the efficiency of these methods include the completeness of mineralization, the degree of change in chemical composition and aggre-

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gate state of the products, the coefficient of return of substances to the cycle, the weight and dimensions of equipment, the expenditure of energy, and the toxicity of end products.

The high-temperature and catalytic oxidation methods are most suitable for mineralizing solid and dehydrated human waste and life-support system refuse. The high-temperature method is technologically simple, but requires a temperature of 700—800°C. However, it mineralizes nearly all wastes, producing ash and gaseous products (CO_2, sulfur oxides, etc.). Within a range of combustion regimes the mineral composition of the ash is fairly constant, although its physical and chemical properties may change. One disadvantage of the high-temperature method is the possibility of forming free nitrogen, which must be bound (with additional energy expenditure). It should be noted that some type of high-temperature mineralization must be included in a life-support system because this step burns up the end-products of other forms of processing. This method can be successfully used in partially closed systems.

The catalytic oxidation method of mineralization requires comparatively little energy and produces an acid solution useful for dissolving ash and treating nutrient media for autotrophs. Lower initial temperatures (200°C are required, and the ash formed by this mineralization process is more suitable for further processing. However, experimental conditions must be strictly controlled and long-acting, stable catalysts must be found. The catalytic oxidation method can be advantageously combined with the high-temperature method previously described. This combination can be used in partially closed systems, when the desired end-product is solutions of mineral salts.

The "pressure-cooking" method (oxidation of wastes in the liquid state) utilizes high pressure and high temperature and can be used to mineralize liquid human wastes, diluted urine-fecal mixtures and plant residue. This complicated method deserves more study because it produces a solution of mineral salts directly. Owing to the variety of organic substances subjected to mineralization, it is difficult to obtain a solution of constant composition. Experimental investigation of this self-sustaining exothermal process showed 90% minerali-

zation of urine-fecal and fecal mixtures. Unfortunately, the remaining unidentified organic substances are very toxic for plants and must undergo additional processing. Traces of hydrogen, saturated and unsaturated hydrocarbons, and ammonia are found in the vapor after mineralization. Furthermore, the high pressure (150 atm) and temperature (250—275°C) required make this method technologically difficult. A possible use for this method is high-temperature hydrolysis of urea, producing ammonia and nitric acid. More research is required to determine the place of the "pressure cooking" method in a complex life-support system.

An aerobic method was selected to demonstrate biological mineralization. Biological mineralization can be intensified by (1) increasing the total number of microbes by regenerating the activated sludge, (2) increasing oxygen utilization by prolonging contact of the mixture with air (without increasing the length of aeration), or (3) by using higher temperatures during cultivation of activated sludge. Long-term experiments were conducted with a concentrated (1:30) urine-fecal solution aerated for 4 hr, with the

following results: 85% mineralization of organic substances and 95% conversion of nitrogen-containing substances into nitrates.

Gaseous products of waste mineralization must be converted into solid or liquid form for use as plant nutrients. With the catalytic method of mineralizing gaseous substances, oxides of nitrogen and sulphur, CO_2, and water are obtained. Mineralization of a daily amount of solid and liquid human wastes produces as much as 3.0—4.0 g of free nitrogen, 0.5 g of hydrogen, 3.0 g of carbon monoxide, 7.0 g of ammonia, and as much as 5.0 g of saturated and unsaturated hydrocarbons. During this process, as much as 122 g of CO_2 can be formed and 60 g of oxygen expended. The end product, after mineralization and purification, must contain only nitrogen, oxygen, and CO_2.

Mineralization of human and plant wastes is closely connected with the regeneration, conditioning, and storage of water. Water sources are water-containing products of human metabolism and life-support system operation, a condensate of atmospheric moisture, and water of transpiration. A water-regeneration system weighs 20—

ACC NR: AT7011648

50 kg regardless of flight duration, while a water supply for three men on a 30-day spaceflight can weigh 495 kg. One man requires approximately 4 liters of water per day, of which 1200 ml is drinking water, 1000 ml is needed for food preparation (more for dehydrated food), and 1800 ml for hygienic needs. Sufficient water for these purposes can be supplied by atmospheric moisture, urine, water left from washing, water of transpiration from higher plants, and algal substrate. The most promising methods for regeneration of water from human metabolic wastes are catalytic oxidation, vacuum distillation, and lyophilization. Lyophilization or molecular drying utilizes the vacuum and low temperatures of space. Studies have shown that water can be purified with sorbents (including ion-exchangers) if organic substances are oxidized first and semipermeable membranes are used. A number of other methods can be used for regeneration of water—electrochemical methods, ultrasound, radiation, and ozonation. Hygienic and chemical properties of water regenerated by lyophilization, vacuum distillation and catalytic oxidation are listed. These data show the need for additional purification by sorbents in some cases.
Orig. art. has: 1 table. [ATD PRESS: 5098-F]
SUB CODE: 06 / SUBM DATE: none

Card 6/6

POSPELOV, G.L., starshiy nauchnyy sotrudnik; LAPIN, S.S.; BELOUS, N.Kh.; KLYAROVSKIY, V.M.; KINE, O.G.; VAKHRUSHEV, V.A.; SHAPIRO, I.S., starshiy nauchnyy sotrudnik; KALUGIN, A.S.; MUKHIN, A.S.; GARNETS, N.A.; SPEYT, Yu.A.; SELIVESTROVA, M.I.; RUTKEVICH, V.G.;BYKOV, G.P.; NIKONOV, N.I.; SAKOVICH, K.G.; MEDVEDKOV, V.I.; ALADYSHKIN, A.S.; PAN, F.Ya.; RUSANOV, M.G.; YAZRUTIS, E.A.; ROZHDESTVENSKIY, Yu.V.; SAVITSKIY, G.Ye.; PRODANCHUK, A.D.; LYSENKO, P.A.; LEBEDEV, T.I.; KAMENSKAYA, T.Ya.; MASLENNIKOV, A.I.; PIPAR, R.; DODIN, A.L.; MITROPOL'SKIY, A.S.; LUKIN, V.A.; ZIMIN, S.S.; KOREL', V.G.; DEMBIKOV, I.V.; BARDIN, I.P., akademik, nauchnyy red.; GORBACHEV, T.F., nauchnyy red.; YEROFEYEV, N.A., nauchnyy red.; NEKRASOV, N.N., nauchnyy red.; SKOBNIKOV, M.L., nauchnyy red.; SMIRNOV-VERIN, S.S., nauchnyy red. [deceased]; STRUMILIN, S.G., akademik, nauchnyy red.; KHLEBNIKOV, V.B., nauchnyy red.; CHINAKAL, N.A., nauchnyy red.; SLEDZYUK, P.Ye., red.toma; SOKOLOV, G.A., red.toma; BOLDYREV, G.P., red.; VOGMAN, D.A., red.; KASATKIN, P.F., red.; KUDASHEVA, I.G., red.izd-va; KUZ'MIN, I.F., tekhn.red.

[Iron-ore deposits of the Altai-Sayan region] Zhelezorudnye mesto-rozhdeniia Altae-Saianskoi gornoi oblasti. Vol.1. Book 1. [Geology]

(Continued on next card)

POSPELOV, G.L.---(Continued) Card 2.

Geologiia. Otvetstvennyi red. I.P. Bardin. Moskva. 1958. 330 p. (MIRA 12:2)

1. Akademiya nauk SSSR. Mezhduvedomstvennaya postoyannaya komissiya po zhelezu. 2. Postoyannaya mezhduvedomstvennaya komissiya po zhelezu Akademii nauk SSSR (for Pospelov, Shapiro, Sokolov). 3. Zapadno-Sibirskiy filial Akademii nauk SSSR (for Vakhrushev, Pospelov.) 4. Zapadno-Sibirskoye geologicheskoye upravleniye (for Sakovich). 5. Krasnoyarskoye geologicheskoye upravleniye (for Pan). 6. Zapadno-Sibirskiy geologo-razvedochnyy trest Chermetrazvedka (for Prodanchuk). 7. Sibirskiy geofizicheskiy trest (for Pipar). 8. Vsesoyuznyy geologicheskiy nauchno-issledovatel'skiy institut (for Dodin). 9. Gornaya ekspeditsiya (for Mitropol'skiy). 10. Gornoye upravleniye Kuznetskogo metallurg.kombinata (for Lukin). 11. Tomskiy politekhnicheskiy institut (for Zimin). 12. Sibirskiy metallurg.institut (for Korel'). 13. Trest Sibneftegeofizika (for Derbikov). (Altai Mountains--Iron ores) (Sayan Mountains--Iron ores)

S/035/61/000/004/011/058
A001/A101

3,1200

AUTHOR: Yazev, A. I.

TITLE: On astrometric works of the Astronomical Observatory at the Irkutsk State University imeni A. A. Zhdanov

PERIODICAL: Referativnyy zhurnal. Astronomiya i Geodeziya, no. 4, 1961, 16, abstract 4A204 ("Tr. 14-y Astrometr. konferentsii SSSR, 1958". Moscow-Leningrad, AN SSSR, 1960, 77-79, Engl. summary)

TEXT: Time signals are regularly received by a chronoscope and clock corrections are determined by means of a photoelectric transit instrument. In connection with the IGY the equipment was renewed and modernized. Since 1958 the Latitude Service has resumed the work with a new ЗТЛ-180 (ZTL-180) zenith - telescope. Observations are carried out according to the 4-group program of the Poltava type, common with the program of the Poznan' Latitude Station. The bright star β Dra was also included in the program. The instrument was investigated.

D. P.

[Abstractor's note: Complete translation]

Card 1/1

YAZEV, A.I.; MARKOV, Yu.V.

Electronic relay for a recording chronograph. Izm.tekh. no.12:22 D '61. (MIRA 15:1)

(Chronograph)

YAZEV, V.

Legal problems in the centralized delivery of goods. Sov. torg. no.2:26-31 F '58. (MIRA 11:1)
(Delivery of goods) (Commercial law)

YAZEV, V. A.

N/5
751.1
.Y3

Dogovor Postavki V Sisteme Sovetskoy Torgovli (The Supply Agreement in the System of Soviet Trade). Moskva, Gostorgizdat, 1956.

88 p.

Bibliographical footnotes.

YAZEV, Vasiliy Afrikanovich; KAZAKOVA, L.A., red.; TARASOVA, N.M., tekhn.red.

[Sale of goods to the population on credit] Prodazha tovarov naseleniiu v kredit. Moskva, Gos.izd-vo iurid.lit-ry, 1960. 43 p. (MIRA 13:7)

(Consumer credit)

Participation of small intestine in fat metabolism. B. I. Kadykov and L. I. Vazeva (Sanit.-Hyg. Sci. Research Inst., Leningrad). *Doklady Akad. Nauk S.S.S.R.* 105, 850-7 (1955).—Expts. with dogs in which intestinal loop fistula technique was used in connection with dietary loading with butter showed that the upper small intestine, which is first activated in the assimilation process, loads the veins with a considerable fat content, while the lower sections of the intestine actually show a decline in lipides, by retention of blood lipides by the intestinal cells; either cholesterol or neutral fat or both may be so retained, indicating active participation of the small intestine in some intermediate metabolic processes of lipides. G. M. Kosolapoff

KODOLOV, I.V., starshiy prepodavatel'; YAZEVA, L.P., inzhener-issledovatel'

Ways to increase the rate of removing molded articles from vulcanizing presses. Trudy Ural. politekh. inst. no.120:105-111 '61.
(MIRA 16:6)

(Sverdlovsk--Rubber industry) (Vulcanization)

GAVRILYUK, V.M. [Havryliuk, V.M.]; YAZEVA, V.G. [IAzieva, V.H.]

Adsorption of Ba atoms and BaO molecules in an autoelectronic projector. Ukr. fiz. zhur. 3 no.3:421-424 My-Je '58. (MIRA 11:10)

1. Institut fiziki AN USSR.
(Electron beams) (Barium) (Barium oxide)

83577

9,6150
26.2310
24.2120

S/056/60/038/005/010/050
B006/B070

AUTHORS: Gabovich, M. D., Pasechnik, L. L., Yazeva, V. G.

TITLE: Detection of Ion Oscillations in a Plasma

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 5, pp. 1430-1433

TEXT: Ion oscillations with a limiting frequency of $f_o = \sqrt{ne^2/\pi M}$ have been known for electron beams with compensated space charge, but they had not yet been found in the plasma of a gas discharge. It is shown in the present work that it is possible to make a direct determination of self-sustaining ion oscillations in the plasma of a gas discharge. The experimental apparatus consists of a discharge tube in which there is an arc discharge in mercury vapor; the charge concentration in the plasma can be varied by varying the discharge current. There are two probes in the plasma, one fixed and the other movable. The distance between them could be altered from 0 to 15 mm. The arrangement for the detection of ion oscillations is described in brief. Essentially, it consists of a preamplifier, a superheterodyne amplifier of the type ИП-12М (IP-12M), a special three stage

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Detection of Ion Oscillations in a Plasma

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narrow-band amplifier, and a tube voltmeter. The sensitivity of the amplifying arrangement can reach $\sim 2 \cdot 10^{-8}$ v. The results of measurement are shown in Fig. 2: With increasing discharge current I, the voltage U_{out} at the output of the amplifier system increases, passes through a maximum, and then falls steeply. The position and the height of the signal peaks in the $U_{out}(I)$ diagram depend on the frequency f of the amplifier. Fig. 2 shows the characteristics for f = 1.6, 2, and 2.4 Mc/sec. Fig. 3 shows the dependence of the resonance currents on the potential of the probes for 6 f-values between 1.6 and 2.6 Mc/sec. I_{res} increases linearly with U_{probe}, and the greater f the greater is the slope of this straight line. (I_{res} is the I-value corresponding to the peak of U_{out}). The following relation (2) holds for the frequency of the ion oscillations: $f = f_o/\sqrt{1+ne^2\lambda^2/\pi kT_e}$, where λ is the wavelength. With this, the charge density in the plasma is $n = f^2/(e^2/\pi M - e^2f^2\lambda^2/\pi kT_e)$; ($n_{exp} \approx 10^{10}$ cm^{-3}). It may be assumed that the probe selectively indicates oscillations with a wavelength that is

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Detection of Ion Oscillations in a Plasma

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approximately equal to the radius of the ion layer surrounding the probe. Since the radius of the ion layer surrounding the probe increases with increasing potential of the probe, n and I_{res} must increase not only with f but also with negative potential U_{probe} of the probe. This is actually found to be so experimentally. It is also found that $\lambda^2 < kT_e/Mf^2$. As a practical example (corresponding to the experimental conditions), one has $\lambda_{max} = 6.4 \cdot 10^{-2}$ cm with $T_e = 3.8 \cdot 10^4$ °K and $f = 2 \cdot 10^6$ cps. Such a thickness of the ion layer ($\sim \lambda_{max}$) fairly agrees with the experimental results. By extrapolating the curves shown in Fig. 3 for a zero potential of the probe, n_o and $I_{o\,res}$ may be obtained; and also here theory and experiment agree satisfactorily (Fig. 4). It has, thus, been possible to detect by these experiments the oscillations of ions and to verify formula (2) qualitatively. V. D. Rutgayzer and K. I. Kononenko are mentioned. There are 4 figures and 6 references: 1 Soviet, 4 US, and 1 Irish.

SUBMITTED: November 23, 1959

Card 3/3

GABOVICH, M.D. [Habovych, M.D.]; YAZEVA, V.G. [IAzieva, V.H.]

Correlation of low-frequency and high-frequency oscillations induced in a plasma by an electron beam. Ukr. fiz. zhur. 7 no.9:1015-1020 S '62. (MIRA 15:12)

1. Institut fiziki AN UkrSSR, Kiyev.
(Plasma oscillations) (Electron beams)

9(2)

SOV/107-58-12-47/55

AUTHOR: Yazgur, O. (Leningrad)

TITLE: A Training Device for Sound Reading (Ustanovka dlya obucheniya priyemu na slukh)

PERIODICAL: Radio, 1958, Nr 12, P 54 (USSR)

ABSTRACT: This device makes it possible to train radio-telegraphists in any building or even in the open air. It is constructed on the basis of a standard telegraph key: a generator on type P1A transistors is located in a carbolite tray and three type FBS dry cells are located in the lid. The dynamic inset of a handset is used as a loudspeaker. The transistorized generator, whose circuit diagram is shown in Figure 3, is a multivibrator feeding a one-stage l-f amplifier, constructed according to a normal symmetrical circuit and producing l-f voltage square pulses. They key interrupts the supply circuit of the loudspeaker.

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A Training Device for Sound Reading

The device can take 30 pairs of head receivers, and uses a current of about 10 ma. Its exterior view and the mounting of the components are shown in Figures 1 and 2, respectively. There are 2 drawings and 1 circuit diagram.

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